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Environmental product information schemes: an overview

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The proliferation of environmental product information schemes (EPIS) in the past two decades has included a great variety of different EPIS. Efforts have been made to classify existing EPIS according to their application status (i.e. mandatory or voluntary) and general characteristics of labels such as format, multi-stakeholder approach, ISO typology and so on (see Section 2.2). One has the general impression that the area of EPIS is to a high degree heterogeneous and fragmented. Indeed, fundamental differences between the schemes exist. Taking the mandatory versus voluntary cutting line, corresponding instruments distinguish themselves in general terms: on the one hand, voluntary EPIS are market-based purchasing information tools indicating degree of environmental excellence, whereas, on the other hand, compulsory EPIS are regular policy instruments setting minimum standards of information requirements for all relevant products in the market. The fragmented EPIS landscape has led practitioners and scholars to focus on individual EPIS. A lot of work has been done on individual EPIS tools, focusing first of all on classical ISO Type I labels (so-called eco-labels) ranging from scheme compilation (see e.g. OECD 1991; US EPA 1993, 1998), through comparative scheme analyses (e.g. on the German Blue Angel, see Landmann 1999; Neveling 1999), to single-scheme performance studies (see e.g. Bjørner *et al*. 2002; OECD 1997a; UBA 1998). Just lately, other EPIS such as ISO Types II and III have received attention (see e.g. Bogeskär *et al*. 2002; NCM 2002).

What is missing so far in EPIS literature is any systematic view on EPIS in general. Therefore, we propose to analyse EPIS according to a phase model. From an analytical perspective, EPIS can be distinguished in several phases: the establishment phase, including institutionalisation of the scheme, selection of products and elaboration of criteria; the market phase, considering both the supply and the demand side; and a monitoring phase (see Fig. 3.1). In a little more detail, the phases are as follows:

- Establishment phase:
  - Institutionalisation: the phase, during which all political and administrative procedures are developed for a specific scheme

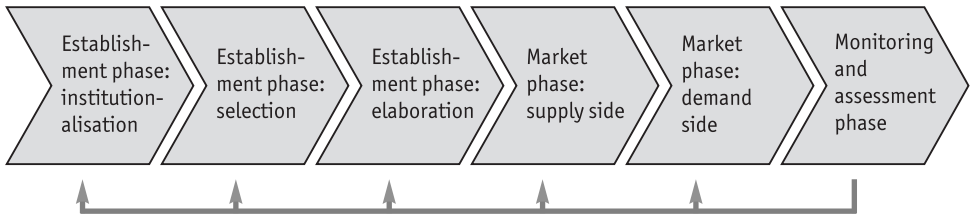


FIGURE 3.1 Phases of environmental product information schemes

  - Selection of products: the phase where eligible product groups are defined
  - Elaboration of criteria: the phase where product requirements and criteria are set up and agreed
- Market phase:
  - Supply: here, the focus of interest is on the success of the eco-label in terms of adoption by industry and business
  - Demand: here, the focus of interest is on the success of the eco-label in terms of increased demand
- Monitoring and assessment: in this phase, the efficiency and effectiveness of EPIS should be assessed via evaluation methods in order to provide feedback to the previous phases

In Sections 3.1 and 3.2 we discuss the single life-phases of EPIS mentioned above. Some (i.e. the most common) schemes will be described in more detail, whereas other, illustrative, examples of EPIS found during research will be shown as boxed information in order to give an overview of the broad landscape of environmental information on products. In Section 3.3 we provide some background information on the state of the art regarding the monitoring and assessment phase.

3.1 Phase 1: establishment

3.1.1 Institutionalisation

For all EPIS the institutionalisation phase lays the foundation stone. At this stage, several crucial EPIS elements have to be established—the principal institutional arrangement, forms of stakeholder participation, formal decision-making procedures, the setting of a legal foundation, labelling design (format, range of application) and process (criteria-setting, code of practice, control regime, sanctions) and financing. Thus, the institutionalisation phase can be defined as being the initial phase of an EPIS life-cycle where the principal functional mechanisms and functional conditions are fixed and the EPIS format is designed (mandatory labels, ISO Types I, II and III).

3.1.1.1 Mandatory labels

The institutionalisation of mandatory EPIS takes place in politics. The legislator, identifying a need for action, prepares draft laws in co-operation and/or consultation with stakeholders in order to implement them via the formal legislative process.

In EU member states and associated countries, mandatory product information is based primarily on EU prescriptions. There are several forms of mandatory labelling, depending on their main objective—compulsory product labelling, compulsory use and disposal labelling, compulsory declaration of contents and compulsory attention to conformity. Government initiatives to oblige producers and retailers to label their products takes place when a fundamental information deficit is identified that has the potential to jeopardise the health or safety of consumers. Hence, mandatory labelling first of all covers health and safety to ensure human protection. Unlike most voluntary EPIS, the main objective is not to inform people on environmental issues. The detailed process of institutionalisation of compulsory labelling in policy-making is not the focus of this project.

Mandatory labels are especially relevant in the case of chemical substances. Several compulsory directives have been published that have to be implemented by EU member states. The most important aspects of these labels are health and safety issues. An exception is the introduction of the danger symbol for 'environmentally harmful' substances and new warnings suggesting the environmental dangers of a substance (see Directive 93/21/EEC; see CEC 1993). Other environmentally relevant labels refer to waste, the prevention of emissions of heavy metals, carcinogenic substances and so on.

Household appliances must be labelled according to a (general) EU directive (92/75/EEC; see CEC 1992). Producers are obliged to indicate the energy consumption, the consumption of specific resources and other information (see the energy label for washing machines, Fig. 3.2). This directive is a framework directive that has to be supplemented by specific directives for each product group under consideration. The EU has applied this directive to the following specific product groups:

- Refrigerators and freezers (94/2/EC; see CEC 1994)
- Washing machines (95/12/EC; see CEC 1995a)
- Tumble dryers (95/13/EC; see CEC 1995b)
- Combined washer–dryers (96/60/EC; see CEC 1996b)
- Dishwashers (97/17/EC and 99/9/EC; see CEC 1997b, 1999a)
- Lamps and light bulbs (98/11/EC; see CEC 1998b)
- Air-conditioning appliances (2002/31/EC; see CEC 2002a)
- Electric ovens (2002/40/EC; see CEC 2002b)

The most important energy label criterion is the consumption of energy. This must be specified in numeric terms and according to a ranking that is subdivided into several groups (from A to G; see Fig. 3.2). For some of the product groups, the criteria for subdivision were elaborated nearly a decade ago; therefore they may be a little out of date. This aspect has been discussed within the Commission of the European Communities (hereafter referred to as the Commission) and the member states, but an

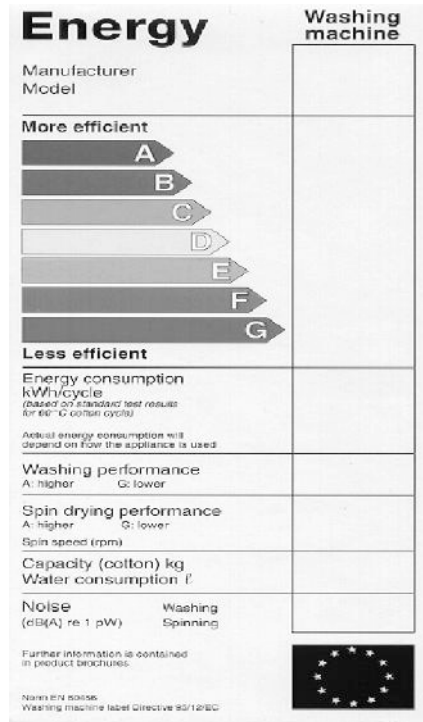


FIGURE 3.2 Energy label for a washing machine as required by EU Directive 94/2/EC (CEC 1994)

update of the threshold values has not been agreed. Instead, new energy classes A+ and A++ will appear for refrigerators and freezers by 2004, indicating much improved standards in contrast to energy class A (Directive 2003/66/EC; see CEC 2003b).

Since the end of 2001, the Commission has agreed an energy label for office equipment (Regulation 2422/2001; CEC 2001c) which works in co-operation with the US Energy Star programme (Fig. 3.3). The regulation is based on an agreement between the government of the USA and the European Union.

The field of mandatory food labelling is complicated. At present, there are more than 40 different EU laws relating to food labelling. A framework Directive (79/112/EEC; CEC 1979) containing basic rules was amended last year (2000/13/EC; CEC 2000b). Recently, the labelling of genetically modified (GM) food has been discussed based on the Novel Food Directive (97/258/EEC; CEC 1997c). In the meantime, Directive 1829/2003 has been implemented prescribing mandatory labelling of GM products from April 2004.

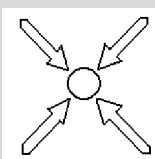
FIGURE 3.3 The US Energy Star logo

Other areas of mandatory labelling are the consumption of petrol and the emission of carbon dioxide (CO_2) from cars (Directive 1999/94/EC; CEC 1999b). The Directive refers to all new cars. The information has to be presented in numeric values and will not be ranked as in the case of the energy label for household appliances. A similar approach has been taken by the Commission in the area of buildings, where a Directive (2002/91/EC; CEC 2002c) on the energy performance of buildings was adopted at the end of 2002. This Directive prescribes that information about energy efficiency has to be presented (energy pass).

Only a very limited amount of national mandatory initiatives have been found, namely:

- Belgium has mandatory labelling of packaging (Box 3.1).
- France has mandatory labelling of packaging.
- The Netherlands has mandatory labelling of product waste in specific product groups (Box 3.2).
- The USA enacted the Mercury-Containing and Rechargeable Battery Management Act of 1996 (Battery Act), obliging manufacturers to label rechargeable and certain small sealed lead–acid batteries. Further examples from the USA of mandatory environmental information disclosure labels include the automobile Fuel Economy Information Programme and the Energy Guide programme.

In Belgium, there is a mandatory labelling scheme as part of the eco-tax system. Eco-tax is an environmental tax developed in 1993 by the Arrêté Royal de 23 décembre 1993, which includes the following: beverage packaging; single-use products; batteries; packaging of some industrial products; pesticides; and some paper and cardboard products.



Box 3.1 The Belgian packaging logo

With regard to consumer chemical waste the Dutch government introduced the KCA (*klein chemisch afval*) logo obligation in 1 July 1994 for specific product groups, such as batteries (with some exceptions), fluorescent lights, thermometers containing mercury, oil filters, nail polish and nail polish removers, glues and cements, chemicals for use in photography, and paint and paint products.

Box 3.2 The Dutch KCA logo

3.1.1.2 Voluntary ISO Type I labels and ISO Type I-like labels

The institutionalisation of classical ISO Type I schemes (i.e. eco-labels; see Section 2.2) started with the introduction of the German Blue Angel in the late 1970s (1978; see Box 3.3), followed just over a decade later (1989) by the Japanese Eco-Mark. The majority

The German 'Blue Angel' was the first official national eco-labelling scheme worldwide. It is by far the most important ISO Type I label in Germany. It is well known and broadly accepted. This is mainly because of the involvement of a wide range of different societal actors in the process of product selection and criteria development. The label apparently works well as a supplementary marketing tool, especially for small and medium-sized enterprises.

Box 3.3 The German Blue Angel

of national third-party labelling schemes emerged during the late 1980s into the 1990s. The widespread introduction of classical ISO Type I schemes reflects a changing perspective in environmental policy towards a more extensive use of so-called 'second-generation' policy tools. The main objectives for establishing ISO Type I schemes are (UBA 1990, quoted in US EPA 1998: 7):

- To guide the consumer in purchasing quality products with fewer adverse environmental impacts
- To encourage manufacturers 'to develop and supply environmentally sound products'
- To use the eco-label as a 'market-oriented instrument of environmental policy'

So far, the majority of European member states have introduced 'classical' ISO Type I schemes (see Table 3.1). In the case of Spain, two classical ISO Type I labels have been introduced—a national and a regional (Catalan) scheme. Countries without a national eco-label such as Italy or Portugal actively support the EU eco-label (Box 3.4).

Although schemes are similar in terms of their major organisational elements, they show some institutional differences. ISO 14024, the existing standard from the International Organisation for Standardisation (ISO 1999a), has been adopted by the various label programmes, but this has not been confirmed or officially acknowledged.

Institutionalisation patterns differ with respect to the role of government and other stakeholders: the Swedish Bra Miljöval has been set up by an independent environmental non-governmental organisations (NGO); the German Blue Angel scheme is traditionally based on a multi-stakeholder approach; and the Catalan El Distintiu is more closely related to regional government (a pluralistic body elaborates the criteria and a public authority decides on their acceptance). In this context, a main issue is the question whether non-governmental players, such as environmental organisations and consumer associations, have the power of veto or only a consulting role. In the case of the Blue Angel these groups actually decide, together with other stakeholders, on the quality of the criteria. In the EU labelling scheme, for instance, the final decision is taken by the Commission so that societal actors have less influence on the outcome of procedures.

Normally, ISO Type I programmes have established different institutional elements for criteria-setting and the administration of awards. The main motive seems to be to increase the efficiency of decision-making processes. The awarding institutions are either independent bodies created especially for the administration of the eco-label scheme (as in the Netherlands and the USA), standardisation institutions (as in France and Spain), 'traditional' organisations dealing with (technical) labelling issues (as in

EU member states *with* national ISO Type I schemes	EU member states *without* national ISO Type I schemes	Other states with national ISO Type I schemes
• Austria • Czech Republic • France • Germany • Hungary • Lithuania • Nordic countries (Denmark, Finland, Norway and Sweden)[a] • Poland • Slovak Republic • Spain[b] • The Netherlands	• Belgium • Cyprus • Estonia • Greece • Ireland • Italy • Latvia • Luxembourg • Malta • Portugal • Slovenia • United Kingdom	• Australia • Brazil • Canada • China • Croatia • Hong Kong • India • Israel • Japan • Korea • New Zealand • Taiwan • Thailand • USA

a The Nordic Swan
b Including a regional scheme in Catalonia

TABLE 3.1 EU member states with and without national 'classical' ISO Type I schemes, and examples of other states with such schemes

The EU eco-labelling scheme, established in 1992, is a voluntary environmental labelling scheme for consumer products. The criteria for each product group are developed by considering the product life-cycle. Environmental criteria are being developed for a wide range of everyday products. The scheme does not cover food, drink or pharmaceutical products.

Box 3.4 The EU Flower

Germany) or public bodies (as for the Catalan and EU labels). The administration normally encompasses the conclusion of contracts with applicants, which incorporates the assessment of certificates and documents. The committee in charge of criteria-setting is usually a pluralistic multi-stakeholder panel. It tackles two main tasks: the selection of eligible product categories and decisions on award criteria.

In all the 'classical' eco-label schemes considered in our research, applications for an eco-label are subject to a verification. The actual processes of verification seem to vary, however. In some countries, the awarding institution is also the institution verifying the information received whereas in other schemes third parties carry out verification (we do not have any information, however, on the control practices used).

Table 3.2 provides an overview of ISO Type I approaches encompassing the 'classical' ISO Type I labels. The criteria reported in this table refer to the following aspects:

- Region covered: the region in which the label should be applied (nonetheless, suppliers from outside this region might be allowed to apply for the label as well, and labelled products can be sold outside the region covered)
- Name: the name of the label programme
- Start: the year of the realisation of the scheme—that is, the time the product requirements were first set down (not necessarily the time of appearance of labelled products on the market)
- Body in charge of criteria-setting: the body that is responsible for the definition of general guidelines and criteria; it might be different from the organisation that actually awards the label (i.e. that concludes the contract with the applicant)
- Open participation: an aspect of the standard that requires interested parties to be allowed to take part in major decision-making processes, often coinciding with a pluralistic composition for the body in charge of criteria-setting

ISO Type I-like labels are labels that contain not most but major elements of the ISO Type I standard (e.g. requiring third-party verification and based on multiple criteria). They are mostly schemes oriented towards a single branch of industry, with criteria for meeting the award aimed specifically at the product groups within that branch (see Box 3.5). In quite a few cases these labels deal even with just one product group. Table 3.3 provides an overview of various ISO Type I-like schemes. It has to be stated that this overview shows a limited number of schemes. Especially in the area of ISO Type I-like labels, an enormous proliferation has taken place. Taking the tourism sector as an extraordinary example, one may count between 46 (BMU 2000: 6) and 63 (Ecotrans 2002) labels—most of them fitting the ISO Type I-like category. With regard to the year of introduction, ISO Type I-like schemes seem to be follow-ups of 'classical' eco-labels, as most of them were established during the late 1990s, being initiated predominantly by non-profit organisations. In contrast to eco-labels, participation is, in most cases, restricted.

3.1.1.3 Environmental product information schemes as self-declaration

The so-called ISO Type II approach could be regarded as a business marketing approach to inform consumers on the environmental qualities of their products by self-declaration ('do-it-yourself' labelling). ISO 14021 (ISO 1999b) formulates some basic characteristics of an ISO Type II label, namely:

- They are voluntary.
- They represent self-declaration.
- There is no independent third-party registration.

ISO 14021 lists several requirements for self-declared environmental claims. Important among these are accuracy, possibilities for verification and consideration of relevant environmental aspects.

The standard was published some years ago. As in the case of the ISO Type I standard, it is difficult to find green claims that explicitly refer to the respective ISO standard.

Region covered	Name	Start[a]	Body in charge of criteria-setting	Open participation?
Austria	Eco Label	1991	Ministry of the Environment and the Association for Consumer Information	Yes
Catalonia, Spain	Distintiu de Garantia de Qualitat Ambiental	1994	General Directorate of Environmental Quality	Yes
European Union	European Flower	1992	EUEB	Yes
France	NF Environnement	1992	AFNOR Certification	Yes
Germany	Blue Angel	1978	Jury Umweltzeichen	Yes
Japan	Eco-Mark	1989	Japan Environmental Association	Yes
Nordic countries	White Swan	1989	Various competent bodies in the participating countries	Yes
Spain	AENOR Medio Ambiente	1994	AENOR	Yes
Sweden	Bra Miljöval	1992	Swedish Society for Nature Conservation	Yes
The Netherlands	Milieukeur	1992	Stichting Milieukeur	Yes
USA	Green Seal	1991	Green Seal Stakeholder Committee	Yes

a The year the label was established
AENOR = Asociación Española de Normalización y Certificación (Spanish Association for Standardisation and Certification); AFNOR = Association Française de Normalisation (French Standardisation Association); EUEB = European Eco-Labelling Board

TABLE 3.2 Overview of selected programmes covering multi-product groups (ISO Type I schemes)

There is, nonetheless, a long tradition of environmental claims, and many of them might be regarded as potential ISO Type II labels (see e.g. Box 3.6).

The arena of green claims, labels and advertisements is expanding at the moment. According to Leubuscher *et al*. (1998: 50):

> The use of misleading claims is changing in nature, but the phenomenon as a whole is showing an increase in both numbers and sophistication—in all member states . . . the ability of the majority of member states to control such claims is poor.

In response to this trend and the increasing confusion among consumers, the EC has agreed on several Directives in the field of consumer protection. Directive 84/450/EEC (CEC 1984), which refers to misleading advertising, is especially relevant to green claims. This Directive was amended by Directive 97/55/EEC (CEC 1997d) in order to include provisions on comparative advertising. The problem of green claims has, however, been touched on only modestly so far.

Region covered	Name	Start	Body in charge of criteria-setting	Open participation	Number of product groups
International	FSC (Forrest Stewardship Council)	1993	WWF	Yes	One (forestry)
Europe	Eco Schools Flag	n.a.	Foundation for Environmental Education in Europe	No	One (environmental education)
Europe	Blue Flag	1987	Foundation for Environmental Education in Europe	No	One (tourism)
Europe	Öko-tex Standard 100	1992	International Union on Research and Testing in the Area of Ecological Textiles	No	One (textiles)
Europe	Pan European Forest Certification (PEFC)	1999	PEFC council	No	One (forestry)
Europe	Gemeinschaft Umwelt-freundlicher Teppichboden (GUT)	1990	Community of Environmentally Friendly Carpets (association of European producers and testing institutes)	No	One (carpets)
Austria	Österreichisches Institut für Baubiologie und -ökologie (IBO) Label	1988	Österreichisches Institut für Baubiologie	Yes	One (construction)
Belgium	Label vert	2000	Tourist Federation of the Belgian Luxembourg	Yes	One (tourism)
Luxembourg	EcoLabel für Luxemburger Tourismusbetriebe	1997	Foundation Öko-Fonds	No	One (tourism)
Spain	Doñana 21	1999	Doñana 21 Foundation	No	Four (food and beverage industries, hotel service providers, handicrafts and rural industries)
Spain	Distintiu Ecoturistic	1994	Alcudia Municipality	No	One (tourist facilities)
The Netherlands	EKO-seal	1995	SKAL	Yes	Several (organic agriculture)
USA	Energy Star	1992	US Environmental Protection Agency (EPA) and US Department of Energy	n.a.	More than 35 (energy-consuming devices, e.g. computers and printers etc.)

n.a. = not applicable

TABLE 3.3 Overview of single-product-group programmes (ISO Type I-like) applied within the EU and Norway

The Forest Stewardship Council (FSC) is an international non-profit organisation founded in 1993 to support environmentally appropriate, socially beneficial and economically viable management of the world's forests. It is an association of members consisting of a diverse group of representatives from environmental and social groups, the timber trade and the forestry profession, indigenous people's organisations, community forestry groups and forest product certification organisations.

Box 3.5 The Forest Stewardship Council

The Austria supermarket chains Billa established a company seal for agricultural products, named ja!Natürlich, and, among other things, requires transparency regarding the flow of commodities. The criteria are drawn from EU and Austrian organic food requirements.

Box 3.6 The Austrian *ja!Natürlich* label

Claims, advertising, marketing and so on are regulated by legislation that is not restricted to environmental aspects but applies also to the whole area of consumer information (e.g. health, safety, quality, technical features). Within the member states of the EU and Norway, Leubuscher *et al.* (1998: 29) identified several different national regulation regimes that can be described as

- Self-regulation by the market, especially by producers
- Regulation based on a legal framework

3.1.1.4 Environmental product information schemes as quantified environmental information

ISO Type III could be regarded primarily as a business-to-business-oriented approach. The ISO technical report ISO/TR 14025 (ISO 2000) formulates the basic characteristics of an ISO Type III label, namely:

- They are voluntary.
- They require quantified environmental information.
- They are based on the ISO 14040 series of standards.

The ISO technical report mentions explicitly that this area is still under development; therefore, several aspects are preliminary solutions and have to be reviewed within three years after the publication of ISO/TR 14025. Several considerations referring to an ISO Type III label have been listed; the following are of importance:

- The voluntary nature of the programme

- Criteria that are based on procedures and results from life-cycle assessments (LCAs) in accordance with the ISO 14040 series of standards
- The requirement for a critical review according to the ISO 14040 series
- The inclusion of open consultation with interested parties
- The need for the relevant environmental information to be presented in a standardised way

A recently published study on behalf of DG Environment identified several single and cross-country ISO Type III initiatives worldwide. Table 3.4 shows selected international initiatives.

Environmental product declarations (EPDs) are a very new environmental product information instrument. The key characteristics of certified EPDs can be summarised as follows (SEMC 2003):

Single country	**Initiative**
Denmark	Pilot project EPD
France	Experimental standard on Type III environmental declarations
Germany	AUB, UBA project (building sector)
Italy	EPD programme
Japan	EcoLeaf
Netherlands	Milieu Relevante Product Informatie (building sector)
Norway	NHO Type III project
South Korea	EPD programme, Korean Environmental Labelling Association
Sweden	EPD programme
United Kingdom	BRE environmental profiles for construction materials
USA	Certified Eco-Profile Programme
Cross-country collaboration	**Initiative**
Canada, Denmark, Germany, Italy, Japan, Korea, Sweden	GED.net
Denmark, Norway, Sweden	NIMBUS

AUB = Arbeitsgemeinschaft Umweltverträgliche Bauprodukt; BRE = Building Research Establishment; EPD = environmental product declaration; NHO = Næringslivets Houedorganisation; NIMBUS = Nordic project for the Implementation of EPD in the Business Sector; UBA = Umweltbundesamt

TABLE 3.4 Overview of selected country and cross-country initiatives

Source: based on Bogeskär *et al.* 2002: 22

- They are **science-based**, requiring the use of internationally accepted calculation procedures for LCA according to ISO standards.
- They are **wide-ranging**, being applicable to all products and services.
- They exhibit **neutrality** through the absence of predetermined performance levels.
- They allow **comparability** through use of similar product-related information based on LCA.
- They show **openness** through the use of easily accessible information available on the Internet.
- They have **credibility**, requiring verification of data by an accredited and independent certification body.
- They have **flexibility**, allowing the possibility of continuous modification of content of the EPD following traditional in-company product development processes.
- They encourage **cost efficiency** by establishing programmes that build on existing certification and registration systems.

There are several experiences of EPD at the international level, both in Europe and in the USA. However, the only country that has established a competent body for the certification of EPDs and that has created a logo is Sweden (Box 3.7).

Sweden was the first country with an ISO Type III-related labelling programme, called 'Environmental Product Declaration' (EPD), established in 1998. The Swedish government appointed the Swedish Environmental Management Council (SEMC, owned by the state, industry and local authorities) to be the competent body for the system of certified EPDs. The system for certified EPDs in Sweden is initiated and driven by business.

Box 3.7 The Swedish EPD label

In Italy, a pilot EPD programme ran during 2000 and 2001. After a break of one year, new EPD activities commenced in the EU with the EU-LIFE project, INTEND,[1] in collaboration with the Swedish Environmental Management Council (SEMC). The main objective of INTEND is the establishment of an international EPD system.

In 2002 Norway initiated the use of Type III environmental declarations that verified environmental information about primary and finished products according to ISO/TR 14025. The declarations were developed in Norwegian and Nordic projects carried out by Østfoldforskning and Byggforsk, chaired by the Confederation of Norwegian Business and Industry (Næringslivets Hovedorganisasjon [NHO]) and the Confederation of Norwegian Construction Industry. The initiative is aimed at semi-finished prod-

1 INTEND concerns the definition of an EPD system that can be applied at the international level and the implementation of such a system in two pilot countries (Sweden and Italy); see www.dichep.unige.it/ge2004/EUROPA%20-%20Life%20Projects%20-%20Project%20Summary.htm.

ucts and parts intended for extensive projects. The EPDs give environmental information aggregated according to LCA and will be verified by third parties and presented according to ISO/TR 14025. In Norway, the NHO is in charge of a programme for developing a registry of EPDs. So far, the main use has been for cement and cement products.

Historically, Japan is one of the world's leading countries in LCA activities; this also holds for ISO Type III eco-labelling. In fact, in September 1998, the Japan Environmental Management Association for Industry (JEMAI), with the support by the Japanese Ministry of Economy, Trade and Industry (MITI), started an experimental programme for Type III environmental declarations. The experimental phase lasted three years and, in June 2002, the ISO Type III label EcoLeaf was officially launched. As for any other ISO Type III programme, the aim of EcoLeaf is to 'present comprehensive information in quantitative form about lifetime environmental impact by the product or service' (JEMAI 2002). Furthermore, the programme aims to encourage industry to plan and develop eco-conscious products and services and to facilitate communication with their customers. The EcoLeaf programme is fully compliant with ISO/TR 14025. In fact, JEMAI representatives participate in the development work of that standard. This means that, concerning methodology, the programme is based on LCA and results are subject to third-party verification by inspectors as well as to assessment by researchers, LCA specialists and consumers. Moreover, the LCA study must be done in accordance with the ISO 14040 series and to the so-called 'product specification criteria', which are defined with a standard procedure for each product group. The label itself consists of three sheets containing information on the product's quantified impact on the environment, the results of impact assessment and a list of inflows and outflows of energy resources, raw materials and chemicals.

In the USA, the Certified Eco-Profile programme is run by Scientific Certification Systems (SCS), an independent, third-party evaluation and certification organisation evaluating a wide variety of food safety and environmental claims. SCS offers a certification programme for environmentally preferable products and services. Programme development followed Executive Order 13101—a bill passed under President Bill Clinton in 1998 dealing with greening the government through waste prevention, recycling and federal acquisition—which directs federal agencies and their contractors to identify and purchase products designated as 'environmentally preferable'. SCS uses a combination of techniques to establish environmental preferability, including life-cycle impact assessment (LCIA), risk assessment and environmental resource-based studies, combined with knowledge of 'best available' technologies and practices.

Each of these initiatives is generally in line with the prescriptions of ISO/TR 14025. However, there is clearly a need for intensive dialogue within Europe in order to avoid incompatible national systems and to increase harmonisation.

As well as country initiatives there are also sector-specific initiatives in the area of quantified environmental information. These activities are pushed first of all by industry itself (i.e. by large companies such as Volvo, Otto Versand or by business associations, such as CEPIFINE [see Box 3.8]). In fact, in France, Germany and the Netherlands, ISO Type III declarations are well developed but are limited to a specific industrial sector (i.e. building products).

CEPIFINE is an international association made up of national associations that are members of the Confederation of European Paper Industries (CEPI) and represents 14 European pulp and paper associations (12 EU member states, Norway and Switzerland). The objective of the association is to collect publicly available economic, statistical and other data related to the European wood-free paper industry and to carry out studies based on this data.

Box 3.8 CEPIFINE

3.1.2 Selection

During the selection phase the responsible body in charge decides on product categories for which eco-label criteria should be elaborated. In addition, during this stage the decision is made as to which product categories will be included or excluded.

3.1.2.1 Mandatory labels

Mandatory labelling in the member states of the EU and also in Norway is based primarily on EU prescriptions. Only a few examples of national compulsory labelling have been identified (see Section 3.1.1.1). Since the specific procedure of compulsory labelling has not been the focus of our research it remains unclear what determines the selection of product groups for mandatory EPIS.

3.1.2.2 Voluntary ISO Type I labels and ISO Type I-like labels

In principle, all ISO Type I schemes invite the general public to submit proposals for new eco-label product groups. In practice, however, most proposals come from industry and from producers of eco-friendly goods. In the case of the German Blue Angel (see Box 3.3), for instance, each year an average of 150 product categories is proposed, of which 90% are submitted by suppliers of environmentally sound goods (Rubik and Teichert 1997: 318; US EPA 1998: 48). However, in the case of the Nordic White Swan the initiative to introduce new product groups is to a large degree taken by the eco-labelling bodies at the national or regional level (see Box 3.9).

Most label schemes exclude food and some exclude pharmaceuticals from possible product groups. The French NF Environment also excludes services, for instance. Other schemes follow a kind of an informal 'blacklist' (i.e. a list of products that are unofficially excluded from the scheme, such as, for example, private vehicles). Only the

The White Swan is the official Nordic eco-label, established in 1989 by the Nordic Council of Ministers, as a harmonised, voluntary and positive environmental labelling of products. The label follows a cross-country approach, with Denmark, Finland, Iceland, Norway and Sweden participating. The White Swan product criteria are established by joint Nordic expert groups which follow the products' life-span (from cradle to grave), with the aim of developing efficient and effective environmental criteria.

Box 3.9 The Nordic Swan

The Green Seal is the only US-wide eco-labelling programme fulfilling the ISO Type I standard. It is awarded by Green Seal Inc. Currently, requirements for more than 30 product groups have been elaborated and accepted by a stakeholder committee representing manufacturers, trade associations, governmental agencies, product users and environmental and public interest groups.

Box 3.10 The US Green Seal

The Eco-Mark is the official Japanese eco-label, established in 1989. Its administration lies within the responsibility of the Japan Environment Association (JEA), a non-governmental organisation under the guidance and advice of the Environment Agency. An LCA approach was incorporated in 1996 and has had to be applied to all product categories added to the scheme since then.

Box 3.11 The Japanese Eco-Mark

Dutch Milieukeur includes food and has elaborated several requirements for different food products. Interesting new approaches are the increasing inclusion of services as a new area and the elaboration of eco-labelling criteria for transport and electricity in the case of the Swedish Bra Miljöval (for an overview of product groups excluded in classical ISO Type I schemes, see Table 3.6 (page 67).

We have the impression that the selection of product groups began with some symbolic green product groups indicating appropriate environmental consciousness and behaviour. In the beginning, the German Blue Angel selected returnable bottles, recycled hygienic paper and CFC-free sprays as some of the product groups to be labelled first. Within the Nordic White Swan we have seen a combination of symbolic products, low-hanging fruits (products that are easy to label) and product groups with a substantial environmental impact such as paper and detergents.

A prioritisation of product groups (i.e. a reflection of the most important product groups, both from an environmental point of view and from the point of view of consumer and/or producer interest) is the exception and not the rule. Recently, the Commission elaborated a draft working programme for the EU eco-label scheme. Also, in 2002, a British consultant started a study supporting the selection of product groups for the EU eco-label (Oldman *et al.* 2002). Their prioritisation approach was oriented towards identifying eco-label product group candidates 'based on their track record in national schemes'.

In Catalonia in 1998 a panel of experts established a priority list for the selection of new groups. This selection is now basically followed by the 'El Distintiu' Competent Body in order to launch new service categories. In general, one can observe that the selection of product groups is often not very systematic but, rather, follows a more pragmatic or symbolic approach. This is somewhat surprising, since there is a great deal of knowledge concerning the environmentally most relevant areas such as housing, mobility and food (e.g. Lorek *et al.* 1999).

The scope of the definition of the product groups seems to be characterised by two different tendencies:

- Categories or product groups can be expanded in scope as the criteria develop. This is practised, for instance, in the Dutch eco-label scheme, where the certification schedule for furniture lists all materials allowed for several furniture products, with each material having to fulfil specific environmental requirements. Thus, the Milieukeur criteria for furniture are based solely on material component requirements and not on a division into further sub-groups.
- Product groups can be divided into sub-groups. For instance, during the Italian work on an EU eco-label for hard floor coverings this product group was split into three sub-groups, and criteria were developed for each of them.

With respect to the demand side, private households are the main target group of national eco-labelling programmes. Most product categories are consumer goods. The only significant exceptions are paper products and office equipment (e.g. computers, copiers, printers and office chairs), which can be bought by company purchasers and by public procurers as well. Perhaps because of the fact that it is the oldest and, in terms of product categories, the largest programme, the German Blue Angel includes a number of other goods not oriented towards the consumer, such as construction machinery, bus-controlled devices for system engineering in buildings, returnable packaging for use in transportation of goods, and municipal vehicles. The Dutch Milieukeur follows a similar path, including categories such as hand dryers and cleaning or recycling of industrial gloves. In 1998 the Spanish AENOR Medio Ambiente launched the service category 'paper recovering and warehousing centres', addressing principally municipalities and waste management companies (Box 3.12).

3.1.2.3 Environmental product information schemes as self-declaration

The selection of products or product groups for self-declared EPIS is decided in business and industry since the environmental claims do not require independent third-party

AENOR Medio Ambiente label

Asociación Española de Normalización y Certificación (AENOR, the Spanish standardisation body), is a private, independent and non-profit organisation. In 1994 it launched the Type I eco-label AENOR Medio Ambiente. The label is to promote the design, production, marketing and use of products that reduce stress on the environment throughout their whole life-cycle and provides accurate, verifiable and relevant information to the consumer.

The Catalan Distintiu de Garantia de Qualitat Ambiental

The El Distintiu de Garantia de Qualitat Ambiental (DGQA) is an ecological labelling system created through Decree 316/1994, introduced by the Autonomous Government of Catalonia in 1994. Initially, El Distintiu was used to guarantee the environmental quality of products, but through Decree 296/1998 of 17 November, the use of El Distintiu was extended to include services, thus making this official system of environmental certification more complete.

Box 3.12 The Spanish eco-labels

registration. The motivation among firms to equip their products with environmental claims is not fully clear. One can imagine that the achievement of a competitive advantage over competitors is of major importance. The 'image' of products among consumers in terms of environmental issues and the general consumer awareness of the environment are assumed to be crucial factors in product selection by consumers. In the case of Germany, for instance, it seems to be a must to label paper products with environmental claims (e.g. regarding use of chlorine-free bleaching or oxygen bleaching). Self-declared environmental claims most often can be found on packaging, paper and food products.

3.1.2.4 Environmental product information schemes as quantified environmental information

The development of quantified environmental information schemes requires business and industry initiatives. Therefore, the selection of products for ISO Type III schemes is dependent on the firms willing to participate. Again, the desire for a competitive advantage could be main reason for firms to participate in ISO Type III activities. A systematic analysis of business reasons to participate, however, is lacking. With regard to 'favourite' product groups, the study carried out by Bogeskär *et al*. (2002) identified initiatives in eight sectors as of the end of 2001 (see Table 3.5).

In the meantime, EPD systems have been evolving rapidly worldwide. In total, product-specific requirements for 86 product groups either exist or are currently under preparation (Environdec 2003).

3.1.3 Elaboration

The setting of criteria is the core issue in the elaboration phase. The elaboration of award guidelines and criteria-setting for selected product groups is the most lavish of the pre-market phases.

3.1.3.1 Mandatory labels

With regard to the EU energy label, the role of stakeholders was crucial during the elaboration phase with regard to the setting of requirements. Besides public authorities, the next most visible participants in the process were producers. Italian experience, for instance, indicates a lack of multi-stakeholder participation. According to the Italian Ministry for Industry, which is the ministry most involved in the EU energy label, in the elaboration phase the following attitudes have been observed in the various Italian stakeholders:

- Producers have contributed the most, in particular through the European Committee of Domestic Equipment Manufacturers (CECED).
- However, the norm and standardisation organisations (e.g. the Comitato Elettrotecnico Italiano [CEI] and Ente Nazional Italiano di Unificazione [UNI], among others) have participated in the development of the energy label in only a minor way.

Programme, by sector or industry	
Automotive sector	Saab; Scania; Toyota; Volvo cars EPD; Volvo trucks EPD
Chemicals sector	AISE Code of Conduct; CEFIC Product Stewardship Programme
Construction industry	AIMCC, France; AUB, Germany; BRE, UK; MRPI, The Netherlands; RTS, Finland; SIA, Switzerland
Energy and transport sector	Vattenfall (part of Swedish EPD)
Electrical and electronic equipment industry	ECMA TR/70; NITO; TCO 95 and 99
Food industry	Bioland; EUREPGAP; HQZ, Germany
Paper and pulp industry	CEPIFINE fact sheets; environmental profile data sheets; paper profiles
Textile industry	IVN 'better–best'; Hess Natur; Otto Versand; Steilmann Group

AISE = Association Internationale de la Savonnerie, de la Détergence et des Produits d'Entretien; AIMCC = Association de l'Industrie de Produit de Construction; AUB = Arbeitsgemeinschaft Umweltverträgliches Bauprodukt; BRE = Building Research Establishment; CEPIFINE = international association made up of national associations that are members of the Confederation of Paper Industries (CEPI); ECMA = European Association for Standardising Information and Communication Systems; EPD = environmental product declaration; EUREPGAP = Euro Retailer Produce Working Group; HQZ = Herkunft und Qualitätszeichen; IVN = Internationaler Verband der Naturtextilwirtschaft; MRPI = Milieu relevante Product Informatie; NITO = Norges Ingeniørorganisation; SIA = Schweizerische Ingenieur- und Architektenverein; TCO = Tjänstemännens Centralorganisation

TABLE 3.5 Overview of identified ISO Type III initiatives in selected sectors

Source: Bogeskär *et al.* 2002

- Similarly, other associations (consumer and environmental NGOs) have not participated very much.
- The distributors were almost completely absent from the process. This is a pity, because their role would have been crucial. Moreover, their lack of involvement is reflected in their (present) low commitment and contribution to the diffusion of knowledge and information to consumers.

3.1.3.2 Voluntary ISO Type I labels and ISO Type I-like labels

Normally, the development of criteria is supported by boards, committees, panels and expert groups representing different economic and social interests (e.g. trade, industry and consumer and environmental organisations). For almost all ISO Type I schemes such a pluralistic and third-party kind of labelling is apparently state-of-the-art. An example such as the Swedish Bra Miljöval, which is an eco-label managed by an environmental NGO (the Swedish Society for Nature Conservation) shows, however, that trust and good reputation can be created by less pluralistic and single-actor procedures as well.

The ISO standard for third-party labelling also prescribes that guidelines have to consider the entire life-cycle of a product. It does not stipulate, however, that full-blown

LCAs have to be conducted during the development of criteria. It is clear that life-cycle thinking (LCT) is normal business for the 'classical' programmes. To what extent LCA methodology according to the ISO 14040 series is being followed, however, varies from country to country. Most often, and owing to the limited budgets of the competent bodies, existing LCA results along with producer information are used for criteria development. If secondary data is not available or is obsolete, studies are conducted by external consultants to analyse the life-cycle impact of the product under consideration. In the Dutch scheme, for instance, a formalised LCA matrix juxtaposing life-cycle stages and environmental parameters was used until 2000. This matrix provided the principal structure for analysis (a similar scheme is used by the EU Flower label) and was recently combined with a software tool based on an LCT approach.

Examples reveal that LCA has a major role to play within third-party labelling, although such assessment is not conducted regularly. LCA can strongly influence:

- The selection of product categories. For example, an LCA showed that polyethylene bags for milk are not inferior to returnable glass bottles and have eventually been considered within the Blue Angel scheme.
- The development of guidelines. For example, LCA results revealed that the superiority of returnable packaging largely depends on transport
- The meeting of environmental priorities. For example, LCA highlighted the need to reduce the consumption of electricity by television sets because of the need to reduce emissions of carbon dioxide (CO_2).

As well as these various (and potential) roles for LCA, the reports provide only few examples where criteria actually address several and, in particular, upstream life-cycle-stages; for example:

- The prohibition of chlorine bleaching agents in hot filter paper or newsprint (Blue Angel)
- Criteria referring to chemical oxygen demand (COD) of leather tanning
- Limits on emissions of volatile organic compounds (VOCs) during the assembly of footwear components (EU Flower)

The varying role of LCA application within the different national and EU schemes might be one reason for the different criteria among countries.

Two main principles for criteria-setting exist: the hurdle and the scoring principle. A hurdle system is characterised by a number of minimum standards that all have to be met at the same time. In contrast, a scoring system allows for some weighting among different environmental criteria. In the different labelling schemes, the hurdle principle dominates; so far, the scoring principle has been applied in only a few cases (e.g. the European eco-label for detergents; the label for food products in the Dutch system; the label for tourism within the Austrian scheme). The prevalence of the hurdle system implies a dilemma. The core element of the scoring principle is the possibility to compensate for the failure of a product regarding some eco-labelling requirements with success regarding other eco-labelling criteria. Such a scoring scheme could consider national priorities (e.g. with regard to environmental objectives and/or to consumer

interests) more appropriately. It could also encourage product innovation by applying more ambitious environmental requirements.

Technical progress continuously alters the environmental features of products. That means that there is a systematic temporal gap between criteria-setting and market developments. All schemes analysed attempt to tackle this dilemma by a periodic dynamisation of the criteria. The guidelines are frequently updated—on average, every three years—taking into account scientific and technological progress. This built-in updating mechanism is normally used in a flexible manner; for instance, in the case of technological quantum leaps, revision might be conducted before the end of the three-year period. It is not clear, however, whether this flexibility has actually worked and is sufficient to cope with technological progress in certain areas (e.g. in consumer electronics and computers).

There is a lack of mutual international recognition and co-operation. At the moment, different ISO Type I schemes co-exist in Europe. Catalan and Swedish consumers are each confronted with three different eco-labels—the Catalan, Spanish and EU label in the case of those in Catalonia, and the Nordic Swan, Falcon and EU eco-label in the case of consumers in Sweden. Co-operation between labelling schemes is seldom practised. Exceptions to this are found in Austria; where the EU eco-label requirements for a specific product group are adopted one-to-one by the Austrian eco-label scheme, and in the Netherlands, where, in the case of similar product groups, the national Milieukeur is replaced by the EU Flower label in order to avoid double labelling. This suggests a new trend with regard to the relationship between the EU eco-labels and national schemes. Efforts have been made to co-ordinate EU schemes with other eco-label schemes in the member states. One aim for the EU Flower scheme at its commencement was the successive replacement of member-state labelling schemes with the Flower scheme—a goal that to date has failed.

The co-existence of national and supranational schemes has led to the conviction of the need to co-operate. The EU Flower Working Plan 2002–2004 (2002/18/EC; see CEC 2002d), therefore, led to the establishment of the Co-operation and Co-ordination Management Group (CCMG). A major task of the CCMG will be to examine the possibility for mutual recognition and credit for use of labelled products.

Table 3.6 summarises institutional aspects of classical ISO Type I schemes.

The number of product groups for which requirements have been elaborated varies from programme to programme. The number is apparently larger the older the scheme:

- German Blue Angel scheme (established 1978): 94 groups
- Austrian (1991), Nordic (1989), Dutch (1992) and Japanese (1989) schemes: between 40 and 68 groups
- European (1992), French (1992), Spanish (1994), Catalan (1994) schemes and the Swedish Falcon (Bra Miljöval) (1992): about 10–20 categories

An analysis of the focal areas of the schemes in terms of number of product groups within one category reveals the following important categories in which the number of product groups accounts for at least 10% of all the considered product groups:

- Cleaning (Austrian, EU, French, Nordic, Swedish and Dutch schemes)

Name of the programme	Country	Criteria principle	LCA	Verifi-cation?	Excluded product groups	Specialities
Umweltzeichen	Austria	• Hurdle (all product groups) • Scoring (only tourism)	LCT	Yes	• None	• Tourism as product group
Distintiu de Garantia de Qualitat Ambiental	Catalonia	• Hurdle for products • Hurdle and scoring for services	LCA LCT	Yes	• Food and beverages • Dangerous substances • Pharmaceutical products • Health centres	• Services as new area • Subsidies
White Swan	Denmark, Finland, Norway, Sweden	• Hurdle	LCT LCA	Yes	• Food	• Services as a new area
European Eco Label	EU member states	• Hurdle • Scoring (some-times)	LCT	Yes	• Food • Pharmaceutical products • Beverages	• Incentive-oriented fee structure with advantages for front-runners
NF Environnement	France	n.a.	LCT	Yes	• Food • Pharmaceutical products • Services • Cars	n.a.
Blue Angel	Germany	• Hurdle	LCT	Yes	• Food	• Services as a new area
Eco-Mark	Japan	• Hurdle	LCT	Yes	n.a.	n.a.
AENOR Medio Ambiente	Spain	• Hurdle	LCT	Yes	• Food and beverages • Pharmaceutical products	• Services as a new area
Bra Miljöval	Sweden	• Hurdle	n.a.	n.a.	• Food	• Detergents for clothes and household care • Electricity • Transport
Milieukeur	The Nether-lands	• Hurdle (all product groups) • Scoring (only food)	LCT LCA	Yes	• Pharmaceutical products	• Enlargement of product groups (furniture) • Food included
Green Seal	USA	• Hurdle	LCT	Yes	• No exclusion	• Annual monitoring of products to ensure the fulfilment of requirements

n.a. = not available; LCA = life-cycle assessment; LCT = life-cycle thinking
Note: in the hurdle principle, all minimum standards must be met; in the scoring principle, a weighting system is used whereby failure in one area may be compensated by good performance in another area

TABLE 3.6 Overview of institutional aspects of classical ISO Type I schemes

- Construction and building (Austrian, French, German and Nordic schemes)
- Paper products (Austrian, Nordic, Spanish, Catalan and Dutch schemes)
- Home appliances (EU and German schemes)
- Gardening and agriculture (Austrian scheme)
- Office equipment (Austrian and Spanish schemes)
- Vehicles and fuel (Nordic scheme)
- Furniture (French scheme)
- Tourism (Catalan scheme)
- Food (Dutch scheme)

3.1.3.3 Environmental product information schemes as self-declaration

Aspects of the elaboration process in environmental self-declaration schemes are difficult to tell. Participation of third parties is rarely, if ever, found. They appear to be internal business tools used entirely within and by the marketing function; they are sometimes updated, either with regard to the environmental requirements or with regard to the product outfit.

3.1.3.4 Environmental product information schemes as quantified environmental information

With regard to third-party participation, all single-country initiatives (see Table 3.4) involve the interested parties during the programme development stage and during the elaboration of the pre-set categories (i.e. categories for which quantified data has to be delivered). The final decision on the categories will then be taken by the administrative bodies. Third-party participation is also common among sector-specific schemes (see Table 3.5). Bogeskär *et al*. (2002: 70) report that only the Volvo initiative does not formally involve external-party input. All other sector-specific programmes integrate third-party input in programme development and the establishment of pre-set categories, although this participation is often restricted to other companies in the same sector. Integration of societal stakeholders, however, is not very common either in country-specific or in sector-specific initiatives.

The consideration of LCA is crucial for ISO Type III labelling. According to ISO/TR 14025, ISO Type III schemes require conformity with LCA according to the ISO 14040 series (see ISO 2000). Bogeskär *et al*. (2002) state that for all country-specific programmes the basis for life-cycle data is the LCA standard. This is also true for most business-led sector-specific initiatives. The ones that do not comply—such as Schweizerischer Ingenieur- und Architektenverein (SIA) and Internationaler Verband der Naturtextilwirtschaft (IVN) 'better–best' (see Table 3.6)—do not go beyond life-cycle consideration in their selection of pre-set categories.

The other crucial aspect of declaration schemes compliant with ISO/TR 14025 relates to the product-specific requirements, which define precisely all assumptions and rules

on how to conduct the LCA study on a specific product group. This allows a comparison of LCA studies.

All in all, one can conclude that LCT is widespread among EPIS as quantified environmental information schemes.

3.2 Phase 2: market

3.2.1 Demand side

In this section on the second phase, we focus on the supply side (i.e. adoption by industry); the demand side (i.e. market penetration) is dealt with in Section 3.3.2, Chapter 4 and in the three case studies (Chapters 5–7).

3.2.2 Supply side

The market phase is a crucial one for all EPIS. Voluntary EPIS in particular are confronted with the problem of acceptance of their criteria by potential applicants and, furthermore, the impacts that labelled products have on the market in terms of their relative market share.

3.2.2.1 Mandatory labels

As described in Section 3.1.1.1, mandatory labelling in the member states of the EU and also in Norway is based primarily on EU prescription. In summary, mandatory labelling within the member states of the EU and Norway seems to be quite harmonised. Most of the prescriptions relate to European legislation. National mandatory labels refer in most cases to aspects of waste management. Besides the 'traditional' labelling of chemical substances, the energy label is the most far-reaching approach at the moment. It addresses white goods and is to be applied to additional product groups, such as brown goods and buildings. A distinction between small and medium-sized enterprises (SMEs) and large companies is not relevant in this case because all companies are forced to respect the mandatory prescriptions; however, specific costs might differ, but information on this aspect is not available.

First experiences and evaluations (Waide 1999; Winward *et al*. 1998) show promising results with respect to the acceptance of such labels by consumers and the influence of those labels on markets.

3.2.2.2 Voluntary ISO Type I labels and ISO Type I-like labels

In analysing and comparing the different schemes, we use a classification developed by the Global Eco-labelling Network (GEN).[2] We modified this classification by adding some new product categories (furniture, tourism, energy and food) and by correcting

2 See www.gen.gr.jp/product_a.html, accessed 15 May 2001.

the allocation of some product groups (e.g. we have moved highlighter pens, which are allocated by GEN to 'paper products' [category 2000], to the category 'office supplies' [category 2100]).

Table 3.7 provides an overview of the application of 'classical' ISO Type I schemes. Horizontally, 23 product categories are listed. The columns list the number of elaborated eco-labelling requirements for the specific product category ('Product groups'), the number of companies allowed to use the eco-label ('Firms') and the number of eco-labelled products ('Products').

The German Blue Angel and the Nordic Swan systems are the schemes applied most often (in terms of the number of products carrying the label) throughout Europe; as at the end of 2002, the German Blue Angel was used by about 1,000 companies for just over 3,100 different products, and the Nordic Swan was by about 650 companies for about 2,900 products; in Japan in mid-2003, the Eco-Mark was used by more than 2,100 companies for about 5,150 products. The Catalan scheme was applied for about 900 different products and the Austrian scheme for about 650 products or sites. The Spanish (about 80 products), European (about 600 products), the Dutch (about 360 products) and French (about 450 products) schemes are used less often.

What product groups are mainly responsible for the visibility of the labels under consideration? An indicator might be to select those groups for which the share of eco-labelled products is more than 4% of all eco-labelled products. By taking this approach, we obtain the following results:

- In Austria, three product sub-groups are responsible for 73% of all eco-labelled products: compostable flower arrangements (34%), tourism (30%) and textile coverings (9%).
- In the EU, five product groups are responsible for 89% of all eco-labelled products: 'home care' (38%), textile products (20%) and footwear (15%), sanitary paper (10%) and bed mattresses (6%).
- In France, four product groups are responsible for 88% of all eco-labelled products: dustbin bags (44%), paints and varnishes (19%), desk furniture (15%) and compost containers (10%).
- In Germany, six product groups are responsible for about 60% of all eco-labelled products: paints and varnishes (25%) and wallpaints (14%), recycled paper (6%) and recycled board (5%), copiers (5%), and woodchip wall coverings (4%).
- In Japan, six product groups, three of them in one product group ('paper products'), are responsible for 58% of all eco-labelled products: plastic products using recycled materials (17%), clothing made from recycled PET resin (14%), paper stationery (9%), printing paper (6%) and packaging paper (6%) and tile blocks made from recycled material (4%).
- In Nordic countries, seven product groups are responsible for 65% of all eco-labelled products: toner cartridges (12%), printed paper (12%), printing paper (11%) and sanitary paper (11%), all-purposes cleaners (8%) and detergents for sanitary facilities (6%) and primary batteries (5%).

		Austria			European Union			France			Germany			Japan[b]		
	GEN code	*Product groups*	*Firms*	*Products*[a]	*Product groups*	*Firms*	*Products*	*Product groups*	*Firms*	*Products*	*Product groups*	*Firms*	*Products*	*Product groups*	*Firms*	*Products*
Batteries	1100	0	n.d.	n.d.	0	n.d.	n.d.	0	n.d.	n.d.	1	1	4	n.d.	n.d.	n.d.
Burners and boilers	1200	1	2	7	0	n.d.	n.d.	0	n.d.	n.d.	4	41	91	1	1	1
Cleaning	1300	4	1	3	4	20	30	2	1	1	3	16	22	1	1	41
Clothing and textiles	1400	1	1	59	2	50	200	0	n.d.	n.d.	0	n.d.	n.d.	5	577	1,286
Construction and building	1500	4	3	7	1	0	0	2	0	0	11	115	299	10	167	362
Gardening and agriculture	1600	4	81	234	1	10	25	1	7	45	5	124	153	2	28	50
Home appliances	1700	2	0	0	4	3	7	1	0	0	13	35	63	4	17	28
Home care products	1800	2	5	10	1	31	218	1	12	86	2	143	1,226	1	3	3
Lights	1900	1	0	0	1	1	3	0	n.d.	n.d.	1	2	9	n.d.	n.d.	n.d.
Office equipment	2000	4	3	26	2	0	0	0	n.d.	n.d.	8	24	226	5	33	179
Office supplies (not paper-specific)	2100	0	n.d.	n.d.	0	n.d.	n.d.	1	0	0	2	0	0	1	19	95
Packaging and containers (not paper-specific)	2200	1	3	8	0	n.d.	n.d.	1	4	16	3	28	42	3	28	80
Paper products	2300	6	8	30	2	9	59	1	1	14	5	170	443	10	647	1,543
Personal care products	2400	0	n.d.	n.d.	0	n.d.	n.d.	0	n.d.	n.d.	3	1	6	1	8	21
Services	2500	2	0	0	0	n.d.	n.d.	0	n.d.	n.d.	5	19	22	n.d.	n.d.	n.d.
Solar energy	2600	1	3	8	0	n.d.	n.d.	0	n.d.	n.d.	3	64	119	3	13	28
Vehicles and fuel	2700	0	n.d.	n.d.	0	n.d.	n.d.	0	n.d.	n.d.	7	73	156	n.d.	n.d.	n.d.
Water-saving devices	2800	3	0	0	0	n.d.	n.d.	0	n.d.	n.d.	4	10	39	1	11	18
Furniture	n.d.	1	1	10	1	4	34	2	2	67	1	49	70	n.d.	n.d.	n.d.
Tourism	n.d.	1	193	193	0	n.d.	n.d.	0	n.d.	n.d.	0	n.d.	n.d.	1	25	125
Energy	n.d.	2	4	6	0	n.d.	n.d.	0	n.d.	n.d.	4	0	0	n.d.	n.d.	n.d.
Food	n.d.	0	n.d.	n.d.	0	n.d.	n.d.	0	n.d.	n.d.	0	n.d.	n.d.	2	6	6
Others	4000	4	26	44	0	0	0	3	20	214	9	80	124	13	523	1286
Total		**44**	**334**	**645**	**19**	**128**	**576**	**15**	**47**	**443**	**94**	**995**	**3,114**	**64**	**2,107**	**5,152**

Note: for many product groups, the exact number of labelled products is not known by the awarding organisation; in addition, the awarding of a licence to display an eco-label is different between the competent bodies and so the data referring to the number of eco-labelled products is not completely reliable

GEN = Global Eco-labelling Network n.d. = data not yet defined

a Products or (tourist) sites b The Japanese figures refer to mid-2003

TABLE 3.7 Overview of the scope of 'classical' ISO Type I schemes as at the end of 2002

(continued over)

Source: authors' research

		Nordic countries			Spain (AENOR)			Spain (Distintiu)			Sweden (Falcon)			The Netherlands		
	GEN code	*Product groups*	*Firms*	*Products*[a]	*Product groups*	*Firms*	*Products*	*Product groups*	*Firms*	*Products*	*Product groups*	*Firms*	*Products*	*Product groups*	*Firms*	*Products*
Batteries	1100	2	13	150	0	n.d.	n.d.	0	n.d.	n.d.	0	n.d.	n.d.	0	n.d.	n.d.
Burners and boilers	1200	3	4	20	0	n.d.	n.d.	1	0	0	0	n.d.	n.d.	0	n.d.	n.d.
Cleaning	1300	6	96	606	0	n.d.	n.d.	0	n.d.	n.d.	6	306	708	1	1	5
Clothing and textiles	1400	1	5	56	0	n.d.	n.d.	1	0	0	1	10	13	1	2	3
Construction and building	1500	5	18	116	0	n.d.	n.d.	1	2	2	0	n.d.	n.d.	6	21	4
Gardening and agriculture	1600	3	11	40	0	n.d.	n.d.	0	n.d.	n.d.	0	n.d.	n.d.	5	8	24
Home appliances	1700	4	4	9	0	n.d.	n.d.	0	n.d.	n.d.	0	n.d.	n.d.	0	n.d.	n.d.
Home care products	1800	1	12	35	1	7	13	0	n.d.	n.d.	0	n.d.	n.d.	1	1	1
Lights	1900	1	0	0	0	n.d.	n.d.	0	n.d.	n.d.	0	n.d.	n.d.	1	1	1
Office equipment	2000	4	22	414	3	0	0	0	n.d.	n.d.	0	n.d.	n.d.	0	n.d.	n.d.
Office supplies (not paper-specific)	2100	2	3	8	1	0	0	0	n.d.	n.d.	0	n.d.	n.d.	1	0	0
Packaging and containers (not paper-specific)	2200	0	n.d.	n.d.	0	n.d.	n.d.	0	n.d.	n.d.	0	n.d.	n.d.	0	n.d.	n.d.
Paper products	2300	7	382	1,101	2	0	0	2	6	57	1	11	70	10	18	28
Personal care products	2400	4	14	106	0	n.d.	n.d.	0	n.d.	n.d.	2	61	204	0	n.d.	n.d.
Services	2500	3	40	41	1	28	28	1	15	26	2	13	15	4	90	90
Solar energy	2600	0	n.d.	n.d.	1	0	0	0	n.d.	n.d.	0	n.d.	n.d.	0	n.d.	n.d.
Vehicles and fuel	2700	5	19	62	1	25	25	1	1	8	0	n.d.	n.d.	0	n.d.	n.d.
Water-saving devices	2800	1	3	6	0	n.d.	n.d.	1	6	665	0	n.d.	n.d.	0	n.d.	n.d.
Furniture	n.d.	2	12	102	0	n.d.	n.d.	0	n.d.	n.d.	0	n.d.	n.d.	1	3	5
Tourism	n.d.	0	0	0	0	n.d.	n.d.	4	37	41	0	n.d.	n.d.	0	n.d.	n.d.
Energy	n.d.	1	0	0	0	n.d.	n.d.	0	n.d.	n.d.	1	67	67	0	n.d.	n.d.
Food	n.d.	0	n.d.	n.d.	0	n.d.	n.d.	0	n.d.	n.d.	0	n.d.	n.d.	27	77	162
Others	4000	0	0	0	3	11	11	4	12	65	1	149	149	8	31	23
Total		**55**	**658**	**2,872**	**13**	**71**	**77**	**16**	**79**	**864**	**14**	**617**	**1,226**	**69**	**257**	**360**

TABLE 3.7 (from previous page)

AENOR = Asociación Española de Normalización y Certificación (Spanish Association for Standardisation and Certification)

a Products or (tourist) sites

- In Spain (AENOR), four product groups are responsible for 95% of all eco-labelled products: paper recovery and warehousing centres (36%), centres for the recovery of end-of-life cars and scrap (32%), paints (17%) and shopping bags (10%).
- In Spain (Catalonia), three product groups are responsible for 87% of all eco-labelled products: products or systems to save water (77%), products made from recycled plastic (6%) and paper and cardboard products (4%).
- In Sweden (the Falcon label), eight (i.e. half of all) product groups are responsible for 90% of all eco-labelled products: all-purpose cleaners (22%), laundry detergents (15%), soaps and shampoos (15%), shops (12%), dish-washer detergents (9%), toilet cleaners (5%), electricity supplies (5%) and recycled paper (6%).
- In the Netherlands, four product groups are responsible for about 64% of all eco-labelled products:[3] car-wash installations (24%), arable products and farming (12%), cat litter (11%), writing paper (10%) and flour (7%).

The figures reveal that the schemes in operation are in most cases 'dependent' on only a small number of product groups. The most significant product areas are paper products, paints, durable office equipment and some products addressing national or regional characteristics (e.g. products for saving water, tourism, flower cultivation and flower arrangements, bags, organisers, food, cat litter and recycled plastic products).

The Dutch MPS hallmark was initiated by Milieu Project Sierteelt (MPS; the Floriculture Environmental Project). Its objectives are to reduce the environmental impact of flower cultivation. Awards are based on a scoring system. Participating growers are given a rating of A (best), B and C (not as good but better than many) for crop protection, use of fertilisers, energy and waste handling.

Box 3.13 The Dutch MPS hallmark

In contrast to these important product groups are what may be called the 'zero' categories—product groups for which eco-labelling requirements have been elaborated but for which label holders do not exist. Their share is substantial in almost all schemes and varies from country to country: in Germany they account for around 36% of the total number of product groups (the number of 'zero' categories was quite low during the late 1980s, but it has increased almost continuously since 1995); in the Netherlands, they account for 24% of non-food product groups and 7% of food product groups; in Austria they account for 40% of the total number of product groups; in Spain (national scheme), 46%; in France, 40%; in Spain (Catalan scheme), 14%; in the EU, around 20%; in the Nordic countries, 20%; in Japan, around 7%; but, in the Swedish Falcon scheme, 0%.

3 For many product groups, the exact number of labelled products is not known to the Dutch awarding organisation.

The increase of 'zero' categories depicts a more general dilemma of current ISO Type I programmes—namely, the question of whether to widen or deepen the schemes: Some programmes have elaborated a plethora of different requirements (e.g. so far the German Blue Angel scheme has elaborated requirements for 94 product groups, and the White Swan scheme has requirements for 55 product groups); however, very few of those product groups dominate the schemes in terms of certified products. Hence, competent bodies have to make a strategic choice regarding whether to enlarge the number of eligible product groups ('widening' the scheme) or to settle on a limited number of product categories and actively support their acceptance in the market ('deepening' the scheme).

In our discussion, as well as introducing the 'classical' ISO Type I labels studied above we also introduced ISO Type I-like labels. Their market penetration depends on scale. The international or European schemes seem to be the ones most often used: the Forest Stewardship Council (FSC) label (see Box 3.5) is awarded to 467 forest owners, the Blue Flag is awarded to 2,804 beaches and marinas (see Box 3.14), the Eco-Schools Flag has membership of about 7,000 schools (see also Box 3.15), the GUT label, relating to carpets tested for a better living environment, is awarded to 77 companies (receiving, in total, 3,500 certificates) and the Öko-Tex Standard is used by 4,500 textile companies (see Box 3.16).

The European Blue Flag programme is promoted by the Foundation for Environmental Education in Europe (FEEE), a not-for-profit, non-governmental organisation representing 25 European countries. The European Blue Flag Campaign brings together the tourism and environment sectors at the local, regional and national level in 21 European countries. More than 2,800 beaches and marinas are now participating in the programme.

Box 3.14 The European Blue Flag

The Eco-Schools programme, promoted by the Foundation for Environmental Education in Europe (FEEE), aims to raise student awareness of environmental and sustainable development issues through classroom study and provides an integrated system for the environmental management of schools based on an approached based on ISO 14001 (the ISO standard on environmental management systems; see www.iso.org) and the EU Eco-Management and Audit Scheme (EMAS; see www.europa.eu.int). At present, there are nearly 7,000 Eco-Schools in 21 European countries.

Box 3.15 Eco-Schools

This label is awarded by the Internationale Gemeinschaft für Forschung und Prüfung auf dem Gebiet der Textilökologie via its member institutes. The association consists of 12 textile institutes from 12 European countries. The Öko-Tex label has been introduced to mark textile products that have good environmental performance in terms of their content of hazardous substances.

Box 3.16 The Öko-Tex Standard 100

It is striking that no systematic consideration of market penetration is undertaken by the EPIS competent bodies. Almost no data, for instance, are available on specific supply-side characteristics such as the share of small and medium-sized enterprises (SMEs) among companies having certified their products. Only a few figures exist: according to the US Environmental Protection Agency (US EPA 1998), more than 75% of awarded manufacturers were SMEs as of 1997. In order to make EPIS a future market success we need to learn more about the special eco-labelling needs of selected target groups.

3.2.2.3 Environmental product information schemes as self-declaration

As in the case of the ISO Type I standard it is difficult to find green claims that refer explicitly to ISO 14021. There is, nonetheless, a long tradition of environmental claims, and many of them might be regarded as potential ISO Type II labels.

The arena of green claims, labels and advertising is expanding at the moment; according to Leubuscher *et al.* (1998: 50),

> The use of misleading claims is changing in nature, but the phenomenon as a whole is showing an increase in both number and sophistication—in all member states . . . the ability of the majority of member states to control such claims is poor.

In the various countries studied, the situation is as follows:

- In Austria, retailers in particular use some environmental labels (e.g. ja!Natürlich, or Natur pur). Environmental claims are restricted by national legislation to prevent unfair competition and misleading advertising.
- In Belgium, some labels created by supermarkets have been found (e.g. referring to food products).
- In France, most such labels refer to waste management and packaging.
- Marketing control acts applied in Denmark, Finland, Norway and Sweden influence the application of self-declaration labels because each claim must be proven. Some producers have reacted by using 'environmental fact' labels, which possess elements of ISO Type III labels.
- There is a wide set of ISO Type II labels in Japan, with Japanese companies being very active in promoting those products that meet self-declared environmental standards. In addition, local governments and towns have introduced their own eco-label schemes. Last, there is also a collective effort by industry to promote environmentally sound products to consumers.
- In Norway, environmental claims in marketing have been examined by Enger (1998), who found that, of 166 brands in 16 product groups, 19% applied some kind of eco-label, and 56% of the labels were quasi-seals (or quasi-labels).
- In Spain, several examples of green claims exist, most of them in the area of paper products.

- In the UK, a 'green claims code' was agreed in 1998 and updated in 2000 (DTI/DETR 2000); its intention is to give guidance to producers regarding environmental claims. Several labels exist (e.g. in the areas of tourism, paper products and buildings).
- In Germany, there are labelling examples that are quite close to the systems envisaged by the ISO standard. As well as on-pack claims, one can observe a number of initiatives taken by companies (e.g. producer brands, such as Hipp for baby food made from organically cultivated ingredients, or Auro, for environmentally sound paints) to convey the environmental qualities of their products via labels, logos and so on. This is especially so with traders. In a similar way to Austria, green claims are regulated by national legislation to prevent unfair competition.

The application of green claims differs considerably among the member states of the EU and in Norway. It is influenced by the regulation regimes, which are either voluntary or mandatory, based on their legal framework. At least so far, the influence of EU-based prescription is very modest, but an update of Directive 84/450/EC (CEC 1984) on misleading claims might stimulate a more harmonised treatment of environmental claims. The plethora of applications might ask for some transitional guidelines with regard to the application of ISO 14021, which has the potential to harmonise schemes within Europe.

3.2.2.4 Environmental product information schemes as quantified environmental information

The adoption of EPDs by firms has been evolving rapidly worldwide (for an extensive overview, see Bogeskär *et al*. 2002). According to GEDNet,[4] as of December 2004, about 80 EPDs on products or services have been certified under the Swedish, Japanese, Belgian, Italian or Norwegian systems, in the following product groups (Environdec 2003):

- Food and beverages
- Pulp and paper (Japan only)
- Coke, refined petroleum and nuclear fuels
- Chemicals and chemical products
- Rubber and plastic products
- Other non-metallic mineral products
- Basic metals

4 The Global Type III Environmental Product Declarations Network (GEDNet), founded in 1999, is an international non-profit association of Type III Environmental Product Declaration organisations and practitioners. The overall purpose of the network is to foster co-operation and encourage information exchange among its members and other parties operating or developing Type III Environmental Product Declaration programmes and to discuss key issues in developing such programmes.

- Fabricated metal products
- Machinery and equipment
- Office machines and computers
- Electric machines and apparatus
- Radio, television and communication equipment
- Furniture
- Recycling
- Electricity, gas and water supply
- Land transport
- Telecommunications

With regard to the number of products affected by country, 42 products are from Swedish companies, 22 from Japan, 13 from Italy, 12 from Norway, 1 from Finland and 1 from Poland (Environdec 2003). Products range from consumables such as food and paper, to very complex products such as the electricity produced by a nuclear power plant. Moreover, as product-specific requirements (PSRs) already exist for many other product groups, the number of EPDs is expected to increase rapidly in the near future.

In addition to such EPDs, dozens of sector-specific ISO Type III declarations are published in the construction, paper and automotive sectors. As far as company size is concerned, it is not surprising that participating businesses are mostly large companies with substantial procurement power. Since EPD schemes focus on business-to-business trade, private procurement power may be seen as a crucial factor.

The Japanese EcoLeaf label, launched in June 2002, has been awarded to 50 products within 19 product groups manufactured by 20 different firms. Looking at the data, there is a clear dominance in the sector producing electronic household and office equipment (accounting for 9 out of 19 groups and 43 out of the 50 product certificates awarded [as of September 2003]). The EcoLeaf label may be displayed on 17 single-use cameras and 16 electrophotographic dry process photocopiers. The strong commitment of Japanese companies at the international level is further confirmed by the strong participation of Japanese companies in the Swedish EPD system (see Box 3.7). As of December 2003, of the 22 Japanese EPDs, 9 products of 4 Japanese firms were registered under the Swedish system (see also Section 3.1.1.4). In addition, according to Environdec (2003), 3 Swedish PSRs are currently being proposed by Japanese companies. (It is worth mentioning that, according to Environdec, the total number of EPDs on Japanese products [not necessarily registered under the Swedish EPD logo or the Japanese EcoLeaf label] is 22 and that the total number of PSRs developed by Japanese companies is 28.)

3.3 Phase 3: monitoring and assessment

The last phase of the EPIS system relates to systematic monitoring and periodical assessment, to which we now turn.

3.3.1 Monitoring

Monitoring and assessment is the last phase of EPIS and it is the key to improving or redesigning the schemes. Once a scheme has been created and introduced into the market, a set of indicators has to be established for success measured in terms of the fulfilment of objectives.

Obviously, not all EPIS follow the same specific goals, but all of them have the same common objective: to promote environmental improvements. To implement this objective, a series of different indicators might be described. Later, in Section 8.1, we present an overview of possible success criteria. However, at present, monitoring of EPIS is restricted to 'quick and easy-to-measure' indicators, such as the number of companies awarded a label, or the number of eco-labelled products (see Box 3.17). Systematic continuous reporting and monitoring of technical, structural, environmental and societal developments with regard to product groups is lacking, which explains much of the story of eco-labelling. Altogether, monitoring is weak, although assessments may be carried out. We report on this latter aspect in the remainder of this chapter.

The EU Eco-labelling Working Plan (C [2001] 4395, [CEC 2001e]) established four parameters for measuring the visibility of the eco-label:

- The number of companies awarded the label
- The number of products labelled
- The number of eco-labelled products sold
- The ex-factory sales value of these articles

Box 3.17 Monitoring of the EU eco-label

3.3.2 Assessment

ISO Type I labelling activities began in the late 1970s. It took quite a long time for the first attempts at assessment to appear. In the spring of 1991 the OECD carried out a first overview of labelling activities and concluded that 'to date there have been no studies of labelling programmes that quantify the effect of environmental labels on product sales or the subsequent environmental impact' (OECD 1991: 28). Based on its work the OECD concluded that

> The greening of products is not happening *because* of environmental labels. Nonetheless, there is evidence that the label can make an important contri-

> bution. In particular, the label can effectively stimulate consumer concern about particular products and encourage manufacturers to move toward a more comprehensive environmental assessment of their products (OECD 1991: 30; emphasis in original).

According to the US EPA (1998: 36), the evaluation method of a programme 'is one of its most important features because it reflects the scientific bases, data sources, and judgement on which product categories are chosen and on which label award decisions are made'. However, a general lack of methodologies and studies on this topic is evident, and only a few schemes have carried out assessments of their effectiveness (notably, the Nordic Swan has done so; see ÅF-IPK 2000). In addition, several different partial studies, dealing with specific environmental aspects, have been performed.[5] Research has been concentrated on the measurement of the effectiveness of EPIS (other criteria used in evaluation studies are efficiency, flexibility, 'side-effects' and level of acceptance; see Rubik 1995: 59). In this context, the US EPA (1994: 5) introduced five indicators for measuring the effectiveness of EPIS:

- The consumer awareness of eco-labels
- Consumer trust in labels (in relation to the credibility of the label and customers' understanding of the label)
- Changes in consumer behaviour
- Changes in manufacturers' behaviour
- Improvements in environmental quality

The first four indicators relate to the realisation of environmental gains. This means that they could be interpreted as 'supportive indicators' to the final indicator, on actual improvements to environmental quality. Others have elaborated additional criteria for success (see e.g. NCM 2001a; OECD 1997a; Rubik 1995). In Chapter 8 we illuminate the question of success criteria in more detail, but, in general, we can say that proposed indicators quite often relate to a purely quantitative description of labelled product groups and products (for specific figures, see Section 3.2.2.2).

In the following sub-sections, we present a short overview of assessments of eco-labels according to some of the above-listed criteria. It is striking that many resources have been used to document results relating the first four indicators, and less to follow up on the last important question. This indicates that is it more complicated to address the last question and more resources are needed to develop necessary integrated projects.

3.3.2.1 Consumer awareness of eco-labels

Awareness of eco-labels among private consumers and the importance of those labels to consumers has been the subject of a number of studies (we do not know, though, of any analysis of this criterion in relation to public and business purchasers). However,

5 The labelling of nutritional aspects has a longer tradition and bears some relationships to environmental labels. However, we exclude such labels from our analysis (for more information, see e.g. Nayga *et al.* 1998).

it is difficult to compare results from these studies because the methods vary substantially. In some studies, consumers were invited to identify eco-labels from a large number of alternatives. In others, they were offered less help in their effort to recognise environmental labels. A summary of selected studies, by country, is presented below.

Belgium

Rousseau and Delaet (1998) examined consumer behaviour with regard to shopping in hypermarkets. They found a high degree of confusion among consumers: Only 50% of participants were able to recognise 4 of the 11 logos shown to them. The EU eco-label was almost never recognised or acknowledged. Only 11.5% of participants identified the label correctly, with 13% thinking it was related to the Belgian eco-tax (for a brief description of the Belgian eco-tax, see Box 3.1). In the same way, logos referring to eco-tax were recognised by only 2.7% of participants. The best-known label was the Green Dot (see Box 3.18), but it was often confused with the symbol for 'recyclable' or 'recycled'. The survey also showed that the best understand logos were those that included a word or a sentence.

The Green Dot is the official logo of Duales System Deutschland AG which was founded in 1990 as a private enterprise. Its purpose is to fulfil the obligations specified in the German Packaging Ordinance of 1991 which introduced a legal obligation on trade and industry to take back and recycle transport, secondary and sales packaging. The process of collection and recycling is financed by licence fees paid by manufacturers to obtain the rights to print the green dot on their packaging. The imprint of the logo 'Der grüne Punkt' (green dot) on a piece of packaging signals that the manufacturer of this packaging has paid a licence fee for its collection, sorting and recycling.

Box 3.18 The Green Dot label

Canada

In a Canadian survey carried out by Environmental Monitor (1993), enterprises were asked about the influence the label had had on their sales. A total of 62% said that it had had no influence on sales; 33% that it had had an influence. However, for those who said the label had had an influence, the degree of that influence was not clear.

As part of the same survey, consumers were asked about their willingness to pay more for eco-labelled products. Whereas in 1990 81% answered they would be willing to pay more money for eco-labelled products, the rate decreased to 57% in 1993 (Environmental Monitor 1993: 14).

In addition, the Canadian Environmental Choice organisation, the body in charge of the Canadian eco-label, carried out a survey in 1992 on the awareness and recognition of the label by consumers. About 42% of Canadian consumers said they were aware of the eco-label (US EPA 1993: 30).

A further study, by Abt Associates , found similar results: whereas in 1990 only 19% of Canadians were able to identify the Canadian eco-label, the figure increased to 51% three years later (Abt Associates 1994: 20).

Nordic countries

The Nordic Swan

According to the results of several studies (e.g. see NCM 1999), recognition of the Nordic Swan label had increased dramatically by the end of the 1990s. For example, according to the overview presented by Bjørner *et al.* (2002: 18f.), general recognition increased from 29% in 1997 to 56% three years later. However, although recognising the symbol, not all participants in the studies were able to give the correct explanation for the label; in 1997, 18% of participants were able to connect the Swan with environmental quality, but in 2000 the figure increased to 29%.

Nowadays, more than 80% of consumers in Sweden, Norway and Finland recognise the White Swan as the Nordic eco-label. The figures vary from one study to another, depending on the design of the research. Also, consumers in Denmark and Iceland show significantly lower knowledge than do consumers in the other participating countries. Knowledge of the label was found to increase with education and income of respondents and to decrease with age of respondents.

In Norway, whereas only 12% of the consumers were aware of the Swan label in the year 1992, the percentage increased considerably, to 66%, in 1994, with only the Pine Tree symbol and the Panda logo of the World Wide Fund for Nature (WWF) more widely recognised (see Ramm 1997; Stø 1998; Strandbakken 1995). Recent surveys (Nyberg 1999: 70) show that approximately 80% of respondents are familiar with the Nordic Swan label.

Other labels

In Denmark and Sweden, consumers also recognise to a large extent the label used for organic food, but this is not the case in Norway. The EU Flower is hardly recognised in Nordic countries, not even in Denmark.

France

The Centre de Recherche pour l'Étude et l´Observation de Condition de Vie (CRÉDOC) carried out a consumer survey on behalf of the Association Française de Normalisation (AFNOR) in 1996 and found that 63% of respondents said that there is a lack of quantitative and qualitative information about 'green' products'. Moreover, more than 80% of the respondents were familiar with eco-labels or green labels. However, we do not know to which eco-label(s) they were referring (US EPA 1998).

Germany

In Germany, the Blue Angel eco-label is widely known. According to a survey in 1987, it was known by 78.9% of interviewed persons (Neitzel 1991). Other surveys, reported by Neitzel in 1989 (Neitzel 1991: 302) and by G&I Forschungsgemeinschaft für Marketing in 1991 (G&I 1991), found that 91.3% and 91.1%, respectively, knew that the Blue Angel is allowed to be used only after specific requirements have been met. Nevertheless, another result of these surveys was that 75.2% (Neitzel 1991: 302) and 75.4% (G&I 1991) believed that other labels were also based on specific requirements.

Another study in Germany was carried out by Christensen (1987). Her survey of only 80 persons cannot be viewed as representative of German consumers as a whole, but the results are instructive. Most of her interviewees (91%) knew the Blue Angel label,

and 86% said that the eco-label would make their purchases easier. Christensen also asked about the advantages and disadvantages of the label; 65% believed that eco-labelled products would cost more than non-labelled products. Also, whether labelled products were of better or worse quality than non-labelled products was a controversial issue, with widely differing opinions being held on the issue. There was no such ambiguity in the belief that the use of eco-labelled products would stimulate positive social reactions from other uninvolved persons. Also, it was believed that personal emotional attitudes would be influenced positively. In sum, Christensen concluded that there might be a trade off between the strengthening of the social–emotional aspects and the weakening of financial–functional aspects.

More recently, Spiller (1999) found in a survey of 215 people that 91% were aware of the Blue Angel label. The institution(s) responsible for the development of the label, however, were known by only 27% of interviewees.

Japan

Consumer awareness in Japan of eco-labelling was studied through various surveys during the 1990s. Opinion polls on environmental protection were conducted by the Japanese Prime Minister's Office in 1990 and 1993 (EPA 1998: B-65). In 1990, the level of consumer recognition of the Eco-Mark was only 22.3%; however, this should not be surprising, as it had been introduced to the Japanese market only a year earlier. By 1993, 53% of respondents stated that they were familiar with the Eco-Mark; 47%, however, said that they did not know anything about it. If we break the results down by gender and age, we find that in 1993 the Eco-Mark was better known to women and older people, with highest rates of recognition among women in their 20s (82%; see Hashizume 1994).

A survey conducted by the Japan Environment Association in 2000 reported the rate of recognition for the Eco-Mark to be as high as 92%; this figure has even been outscored by recognition rates of 95% found in surveys carried out by the Tokyo metropolitan government and by the newspaper *Nihon keizai shimbum* (see Eco Mark Office 2003: 12; Kobahashi 2002: 2).

Spain

A survey by Fundación Entorno (2001) indicates that 60% of Spanish consumers know the recycling symbol, 35% the Green Dot, 20% the EU eco-label and only 10% the Spanish AENOR Medio Ambiente eco-label. Data on the Catalan and other regional eco-labels were not available.

The Netherlands

Stichting Milieukeur (2000: 6) states that in 1999 the proportion of consumers who spontaneously knew the name of the Dutch eco-label was 22% and that the proportion of people knowing the name after receiving help from the interviewers was about 57%. The foundation attributes the increase in the level of awareness among consumers primarily to a national advertising campaign carried out on television.

Summary

It can be observed from the available empirical data that ISO Type I labels are well known, especially in countries where many products are eco-labelled, such as Ger-

many, Japan and the Nordic countries. It is striking, however, that knowledge of the labels is sometimes not deeply rooted in consumers' minds. This underpins the Dutch example, where 57% of respondents were able to correctly recognised the label only after being helped by the interviewers. Moreover, some of the surveys reported appear to be rather imprecise with respect to the kind of labels they asked about and hence do not allow us to make any substantial conclusions.

3.3.2.2 Consumer trust in eco-labels

The trust of consumers in eco-labels has been studied several times. Some examples, by country, are given below.

France

A survey carried out by CRÉDOC (1999) found that the credibility of green products decreased significantly in the late 1990s, with 63% of French consumers in 1999 feeling that there was no guarantee that products actually met the environmental criteria claimed. However, consumers seem to be well aware and informed about the environmental aspects of products. A survey by the Agence de l'Environnement et de la Maîtrise de l´Energie (ADEME 2000) found that more than 66% of French people referred to the energy label when purchasing electric appliances.

Germany

In consumer surveys on behalf of the Umweltbundesamt (UBA; the Federal Environmental Agency), respondents were asked to name indicators of an environmentally sound product. According to the surveys, the Blue Angel has lost its unique signalling position, since terms such as 'eco' and 'environmentally friendly' have continuously gained importance over recent years (obviously accompanied by a plethora of new eco-labels created by individual companies, industrial associations, environmental organisations, testing institutes and so on). Nevertheless, about half of respondents consider the Blue Angel as the appropriate indicator. This share was about 61% in 1992; it was then found to decrease in further surveys in the 1990s but increased again to 55% in 2000 (see Scholl 2002: 98).

The Nordic countries

Consumer trust in the White Swan is reasonable high in Norway, Sweden and Finland. However, in Finland the White Swan has 'competition' from the Blue Swan, a national label. Data for Finland indicates that this Blue Swan confuses consumers in the market. In Denmark, trust in the organic label—the red Ø, a label identifying products from organic farming—is higher than in the White Swan (NCM 1999: 55), but the situation in Denmark is changing rapidly.

For Norway, Tufte and Lavik (1997) reported on a 1995 survey among consumers about the White Swan; 78% of the consumers identified the White Swan as the officially approved eco-label, but only 18% of them guessed—correctly—that the government was behind the scheme. A total of 32% believed that environmental organisations were behind the label, and 23% that it was producers.

3.3.2.3 Producers' acceptance of eco-labels

The acceptance of eco-labels among suppliers has seldom been analysed, since empirical data is scarce. An indicator such as the number of 'zero' categories within the programmes (see Section 3.2.2.2) suggests that all schemes face substantial reservations from industry in certain product categories.

Rubik (1995) explored the effects of eco-labelling using the examples of wallpaper and hairspray. He found that the main company motives for using the label are competitive advantage, its value in product marketing and its contribution to environmental protection. Normally, eco-labelling would be part of a 'green' corporate culture. Companies not using the label feared that adoption of the label would lead to an increase in costs, mainly as a result of the need to change production patterns and product designs, and that the use of the label on some products would lead to negative side-effects for non-labelled models in their product range. Both users and non-users, however, conceded that the Blue Angel had some impact on product innovation and optimisation (in particular in the case of wallpaper).

In late 1997, another survey was conducted among companies with respect to the Blue Angel (UBA 1998).[6] This survey revealed that, in general, companies gave the label good marks. In particular, they acknowledged its value with regard to providing consumer information and in incorporating environmental protection as an additional factor in market competition. It turned out that companies, by and large, accepted the quality of the award criteria, the expenditure required in the application of the eco-label, the processing of the application and also the user fees. That the Blue Angel is part of their marketing toolkit is underpinned by the most important motive for using the label—namely, improving a product's market chances (followed by 'fulfilling customer expectations' and 'helping to protect the environment').

With respect to the benefits of applying the Blue Angel eco-mark, the poll revealed that they are mainly immaterial and indirect in nature. According to the companies consulted, the Blue Angel did not bring about remarkable changes in sales (if at all, and then for 'first users' only). Neither did it improve possibilities for realising higher price margins in the market. Although the feedback of customers regarding use of the label was generally judged to be quite good, it did not enable companies to acquire new clients more easily. The effects on market position were assessed rather sceptically, even though more than 25% of the companies observed improvements. Such scepticism was especially the case for smaller companies.

The feeling regarding the impact on product development are ambivalent. Although two thirds of the respondents said that the statement

> The eco-label has led to a distinct improvement in the ecological quality of the products

is 'partly', 'mostly' or 'completely' true, criticism was voiced as to the potential of the label to guide innovation processes. Owing to the limited adaptability of the award criteria (the lengthiness of the process to develop and update guidelines) there is a risk that competition in ecological innovation will stand still.

6 This restriction to users of the Blue Angel is important, because companies not using the label were excluded from the assessment. Therefore, the results cannot be regarded as representative of industry as a whole.

From the point of view of the label holders consulted, possible ways to further improve the labelling programme would be to cut down the bureaucracy and application costs by simplifying the award criteria for the label, to extend public relation efforts, addressing private and commercial consumers, and to elucidate the ambitions held for the programme and to clarify its procedures and thus increase its credibility.

Market success for eco-labelled products is largely dependent on retailer acceptance, especially in the case of mass-produced products. This has been demonstrated in Nordic countries. The Swedish retail chain ICA and the group of Nordic consumer co-operatives, KF, decided to offer their consumers eco-benign products. Within the product category of laundry detergents, both ICA and KF decided to sell only eco-labelled products in Sweden.

In the survey of producers that UBA carried out in 1998, 35.9% of the respondents intended to inform customers on the environmental aspects of their products by using, among other things, the German eco-label.

Meffert and Ostmeier (1990) examined the use of different marketing instruments and, among them, the Blue Angel eco-label by interviewing about 200 German enterprises. They examined different marketing measures. Within the area 'product policy', 19.8% of the enterprises interviewed claimed that they used the Blue Angel, and 10.7% used own labels.[7] Based on this work of Meffert and Ostmeier (1990), Kirchgeorg divided enterprises into four segments and showed that the Blue Angel is used more intensively by what he described as 'environmentally oriented innovative' and 'environmentally-oriented selective' enterprises than by 'other' enterprises (Kirchgeorg 1990: 150). In this context, Kirchgeorg (1990: 144ff.) defines environmentally-oriented innovative enterprises as those that pursue an environmental strategy, internally and externally, and that react neither by retreat nor by resistance to environmental requirements. Environmentally-oriented selective enterprises also pursue an environmental strategy, internally and externally, but react by retreat or by resistance to environmental requirements.

If we return to Meffert and Ostmeier's (1990) research, we see that advertisements that include environmental claims have been used quite often (by 54.8% of the sample). The influence of the use of the Blue Angel with respect to different success indicators of marketing measures (e.g. increase in turnover or market share) was examined. Enterprises that used the Blue Angel were compared with those that did not. Meffert and Ostmeier (1990) concluded that the success of environmentally-oriented sales measures had been affected where the eco-label was used. Especially improved were the image held by purchasers, co-operation with retailers and the public image of the company or brand. In contrast to the eco-label, the success of own labels was modest.

3.3.2.4 Market penetration

An important success indicator of market penetration is the market share of eco-labelled products in relation to all other products sold belonging to the same group.

7 Several answers were possible. Therefore, the sum of the different marketing measures was more than 100%.

Mattoo and Singh (1994) considered the effects of eco-labelling on market demand and supply. From their theoretically based investigation they concluded that:

> labelling will lead to a reduction in market demand for the product produced by environmentally unfriendly methods if, and only if, the quantity demanded by potentially concerned consumers at the undifferentiated market price is greater than the quantity supplied at this price by environmentally friendly producers.

Mattoo and Singh propose, therefore, the need to analyse the market situation before introducing an eco-label, to avoid counter-productive effects. As a consequence, the requirements should not be fixed exogenously, but endogenously (i.e. they should be based on the market).

In addition, we have collected some anecdotal information with respect to market penetration, by country.

Denmark

A comparative analysis of the effect on Danish consumers of the introduction of the White Swan label was undertaken by Bjørner *et al*. (2002). Their results were focused on different brands of toilet paper and the outcome was that the White Swan had a significant effect.

Germany

An OECD (1997a) study of the market share of eco-labelled paints reported an increase in market share from 1% in 1981 to 60% in the do-it-yourself (DIY) sector and 20% in the handicraft sector in 1995. For sanitary paper products, the market share rose from 32% in 1986 to 64% in 1993 and for administrative paper products the percentage went from 13% to 24% in the same period.

Oeser (1998) observed that the Blue Angel had contributed to achieving an increased market share of returnable bottles for milk and juice. In addition, his analysis revealed that market impact could be the result of side-effects arising independent of the actual awarding of the label. Such informal standard-setting was found to have had some influence in the cases of soil improvers made from compost, rapidly biodegradable hydraulic fluids and sound-proofed bins for the collection of glass for recycling.

Nordic countries

In an assessment of the White Swan label, ÅF-IPK (2000) presented estimates of market shares of eco-labelled products (it should be noted that these shares are rough estimates; see (NCM 2001b: 45):

- For printing paper, it was estimated that the share is about 70% in all Nordic countries (except for Iceland).
- Regarding printed matter, the shares of eco-labelled products are higher in Sweden (about 70%), being 40–70% in Denmark and 10% for Norway and Finland.
- The highest market shares of eco-labelled laundry detergents are found in Sweden (70%), followed by Norway (40–70%) and Finland (10–40%), whereas they are less than 10% in Denmark and Iceland.

- For all-purpose cleaners, the shares are up to 40% in Sweden and Norway and between 10% and 40% in the other Nordic countries.

The main reason for the low Danish market shares for many labelled product groups is that Denmark joined the White Swan as late as 1997. However, Denmark is the country that has experienced the greatest increase in eco-labelled products in recent years.

Jha *et al*. (1993: 25) report that the biggest Norwegian fine paper trader increased the share of products bearing the White Swan sold in Norway from 5% to 50% within one year.

The Netherlands

In some cases, eco-labelling has increased the market share of certified products. De Haes (1997: 5) reports that eco-labelled cat litter increased its market share from 2% to 8%. Other authors report that successful product groups are concrete paving bricks, concrete tiles, writing paper, residential recreation parks, flowers and plants, and arable products. More recently, the Dutch Ministry of Housing, Spatial Planning and Environment has judged the success of the Milieukeur to be very modest, stating that 'the Eco-label Foundation initiated a great many certification programmes, but producers have not been very eager to apply for the label' (VROM 1998: 2).

France

The only data available appears to be that related to paints and varnishes and contained in a report from the OECD (1997a). According to the OECD, 20% of this market is covered by eco-labelled products.

Summary

In general, these examples, with only a few exceptions, show that, currently, systematic assessments of the market impact of eco-labelled products are not available. Evidence is mainly anecdotal in nature. Methodological problems have not been discussed in detail so far (e.g. it is not clear whether an increase in market share of labelled products can actually be attributed to a hallmark rather than other factors, such as changes in consumer awareness, media and/or NGO campaigns and so on.

As well as the direct effects on markets, it appears that indirect effects on products that are not eco-labelled are also important, but evidence on this is also very limited. We concur with the remark of Larson (2003: 530) that 'there has been limited theoretical analysis of the consumer response to labelled products, the resulting market impacts and the eventual impact on reducing environmental externalities'.

3.3.2.5 Environmental effectiveness

The most important systematic statement concerning environmental effectiveness has been delivered by the US EPA, which mentioned that 'aside from a few anecdotal examples there is very little information in this area' (1993: 29) and that 'there are no known studies on ECPs [environmental certification programmes] that address changes in the market or benefits to the environment due to ECP certification' (1993: 30).[8] This statement has been confirmed by Mattoo and Singh (1994: 63), who state

8 The term 'environmental certification programme' is used by the US EPA as a description for different information instruments.

that they 'are aware of no study that quantifies the effect of environmental labels on product sales or the environment'. Also the United Nations Conference on Trade and Development (UNCTAD 1994: 16) writes:

> There is little data available to show what market shares have been captured by environmentally friendly products; firms are reluctant for competitive reasons to disclose such figures, and they [the data] are not collected systematically by any agency. Nor is there a clear idea of how many producers have actually changed production processes to meet eco-labelling criteria, and how such a switch might have actually affected the environment.

This situation has not changed dramatically over recent years. The only remarkable exception is a study to evaluate the effectiveness of the White Swan (ÅF-IPK 2000). The evaluation of the label was initiated by the Nordic Council of Ministers (NCM) and was carried out through co-operation between the environmental and consumer sectors. The goal of the evaluation was to illustrate the White Swan as a policy instrument aimed at helping consumers and the environment and to aid future development possibilities for the label. The evaluation covered a study of eco-labelling environmental information from a consumer perspective, an evaluation of organisational and strategic issues and an evaluation of environmental effects.

Part of the report was dedicated to assessing the influence of the White Swan label on total environmental load. The study found that most of the product groups covered are environmentally relevant, though some of them are of a marginal importance. The sphere of influence is limited, however, by the fact that the label does not cover some very environmentally significant areas, such as transportation, and because of the inability of the scheme to influence the use phase.

Some studies on specific pollution reduction have been performed for certain product groups. For instance, according to Eiderström (1995), the demand for unbleached or environmentally bleached paper in Sweden reduced the use of chlorinated organic compounds from 175,000 tonnes to less than 10,000 tonnes in 1993. Other studies carried out for the competent body for the Swedish White Swan label (SIS 1995) show reductions of 11% in sulphur emissions, 21% in COD (chemical oxygen demand) and 50% in AOX (adsorbable organic halogen compounds) in paper mills as a result of the eco-labelling of fine paper. Another study stated reductions in emissions of carbon monoxide (CO, 78%), nitrogen oxides (NO_x, 58%) and hydrocarbons (C_xH_y, 64%) as a result of the use of eco-labels for oil-fired boilers.

Many quoted experiences refer to the German Blue Angel eco-label. Perhaps rather surprisingly, an official evaluation of the scheme does not exist. A report delivered by the Environmental Data Service in 1989 observed that 'there appears to be no published study on the impact of the Blue Angel programme on particular sectors or brands, or on changes in consumer attitudes or market trends' (ENDS 1989: 19). The situation has not changed.