

INTEGRATED PRODUCT POLICY AND ECO-PRODUCT DEVELOPMENT

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Integrated product policy (IPP) is an initiative at the European Union (EU) level aimed at reducing the environmental burden of products and services throughout their life-cycles by using a toolbox of policy instruments to 'green' markets through 'greening' both the demand side (consumption) and the supply side (product development). IPP is part of a growing trend within environmentally advanced countries in Europe towards product-oriented environmental policies. As such, it represents a new shift in thinking towards 'front-of-pipe' solutions (e.g. the greening of product development and design). Generally, existing environmental policy approaches have tended to focus on point sources of pollution (i.e. production sites and production processes), using 'end-of-pipe' technologies and 'middle-of-pipe' solutions such as waste minimisation, cleaner production and pollution prevention. By focusing on the product development and design phase, IPP aims to tackle the stage at which many of the environmental burdens of products are determined, thus reducing non-point source problems further in the life-cycle. IPP considers the product development process from idea generation to product management and reverse logistics (i.e. 'end-of-life' management [EOLM]).

IPP also aims to green the consumption side of the market by focusing on the way that customers (individual, business-to-business, distributors and governmental) choose, use and discard products and services. The aim here is to reduce the environmental impact of products during their use and to ensure their appropriate disposal at the end of their life. Consumption-side measures can also help to give important feedback to product designers and developers to design, produce and supply greener products to the market by encouraging customers to choose environmentally friendlier products (i.e. through green procurement programmes, eco-labelling schemes, etc.).

IPP is not envisioned to be a new, stand-alone policy but to be integrated into already-existing EU policies and objectives. Its purpose is to develop an overall framework for all

stakeholders involved in specific product groups to manage products in a more environmentally friendly manner. For this reason, IPP aims to be based on stakeholder involvement, market orientation and to take a life-cycle perspective. However, IPP formulation at the EU level is still in its early stages and national approaches at the member-state level are more advanced in some countries than in others. In reality this holistic model of IPP is yet to be implemented at the EU or national level.

The purpose of this chapter is to examine developments in the IPP initiative and how it may influence the development of 'greener' products (i.e. eco-product development [EPD]). The chapter will begin by examining the background, definition, objectives, principles, strategies, components and potential toolbox of IPP. This examination is not supposed to be definitive but instead looks at some of the main discussion points in the IPP initiative. The chapter then goes on to briefly examine environmental product policy (EPP) in Denmark as an example of a national approach. The purpose of this is to examine how some aspects of IPP may be expected to operate in reality. From this, a simplified perspective for IPP is proposed. Finally, the chapter looks at the relationship between IPP and eco-product development in companies, using the electronics sector as an example.

5.1 Background

It is important to make a clear distinction between integrated product policy (IPP) and environmental product policy (EPP). IPP is an EU initiative currently being developed by the Directorate General on the Environment (DGXI) aimed at the formulation of a common product-oriented environmental policy at the EU level. EPP is a more generic term referring to product-oriented environmental policies at a national level inside and outside Europe.

EPPs are receiving increasing attention from policy-makers both nationally and internationally. At the international level, activities such as those carried out by the Organisation for Economic Co-operation and Development (OECD; e.g. the Green Goods conferences and its work on public procurement and producer responsibility) and the International Organization for Standardization (ISO; e.g. its work on environmental labelling and life-cycle assessment and, more recently, on integrating environmental aspects into product development) highlight the international context of EPP.

Within the EU, the antecedents of national EPP activities and IPP reach back to the 1980s, if not before (see Box 5.1 for highlights of the key milestones in the development of IPP). However, it was not until the 1990s that EU member states began to formulate product-oriented environmental policies. The most prominent among these countries are the Netherlands, Denmark and Sweden, which are considered to be the leading countries, followed closely by Germany and Austria. EPPs are also starting to emerge in Belgium, the United Kingdom and Finland. Countries such as France, Italy, Spain, Portugal, Greece and Ireland seem to be lagging behind.

- 1987** The Brundtland report, *Our Common Future*, was published, introducing sustainability as a principle of environmental policy.
- 1987** The French prize 'Ecoproduit' (Eco-product) was created, rewarding environmentally more benign products.
- 1992** The 5th European Environmental Action Programme (EAP) was published; although it does not explicitly mention product-oriented environmental policy, numerous references are made to instruments and measures that are considered to be IPP measures.
- 1992** At the Rio de Janeiro Summit, Agenda 21 stressed the importance of a change in production and consumption patterns.
- 1993** ISO TC 207 'Environmental Management' was founded, with subcommittees on, for example, Environmental Management Systems, Life Cycle Assessment, and Environmental Labelling.
- 1993** The Swedish 'Eco-cycle' Commission was founded, which delivered its final report, *A Strategy for Sustainable Materials and Products*, in 1997.
- 1993** The first international conference on 'Green Goods' in the Hague, The Netherlands, took place from 30 September to 1 October; this workshop was the start of a tradition of conferences in the product policy field: since 1993, in total five 'Green Goods' conferences have taken place.
- 1994** The *Policy Document on Products and the Environment* was published by the Dutch Ministry of Housing, Spatial Planning and the Environment (Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer [VROM]).
- 1992–95** The conceptual report, *Product Policy in Europe: New Environmental Perspectives*, of Oosterhuis *et al.* (Germany) and 'Instituut voor Milieuvraagstukken' was published, with the support of DGXI within the 'Environment and Climate' programme.
- 1995** The OECD's Pollution Prevention and Control Group started its activities in the field of IPP; its important output includes the *Preliminary Results of (Sustainable) Product Policy Survey*.
- 1996** The Finnish Ministry of Trade and Industry published a discussion paper on *Production, Products and Consumption Patterns in Sustainable Development*.
- 1997** A Nordic IPP group (consisting of representatives from Denmark, Finland, Norway, Sweden and Iceland) and the first Nordic IPP workshop were founded.
- 1997** The 'common position' of the Council of the EU, *Towards Sustainability*, was published, listing diverse product-related issues and supporting sustainable production and consumption patterns.
- 1997** The Belgian Federal State of the Law for the Co-ordination of the Federal Policy on Sustainable Development was adopted; this was a first attempt to manage classical policy approaches (from process to product) in an integrated way.
- 1996–98** The Ernst & Young and the University of Sussex's Science Policy Research Unit (SPRU) study on IPP was carried out, with the major report being published in March 1998.
- 1996–97** The discussion paper, *An Intensified Product-Oriented Environmental Initiative*, was published by the Danish Environmental Protection Agency in 1996; in 1997 the report *A Product-Oriented Environmental Initiative* was published.
- 1998** The UK Department for the Environment, Transport and the Regions (DETR) published a consultation paper, *Consumer Products and the Environment*.
- 1998** The Belgian Federal State of the new Law on Product Standards Aiming at the Promotion of Sustainable Production and Consumption Patterns to Protect Health and Environment was adopted.
- 1998** An IPP workshop was organised in December by DGXI in Brussels, with approximately 180 participants; this was the first major stakeholder discussion of the IPP concept.
- 1999** An informal meeting of EU environment ministers took place in Weimar, Germany, 7–9 May; this included a background paper and discussion paper on IPP prepared by the BMU (Bundesumweltministerium für Umwelt, Naturschutz und Reaktorsicherheit [German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety]); the conclusion of the meeting was an endorsement for DGXI to further develop IPP.
- 2000** An IPP workshop jointly organised by the BMU and the BDI (Bundesverband der Deutschen Industrie [Federation of German Industries]) was organised for 1 February.
- 2000** A second Nordic IPP workshop was organised by the Nordic Council of Ministers for 9–10 February, with the presentation of a 'Proposal for a Common Nordic IPP'.

Box 5.1 The chronology of IPP developments

Source: Adapted from BMU 1999

Although there are significant similarities among the national policies developed so far, different elements and measures have been developed and different product groups targeted, which has resulted in a fragmented picture across Europe. One of the reasons for introducing a common EU approach to environmental product policy (i.e. IPP) is the necessity of harmonising these national approaches. Therefore, the concept of IPP was introduced as a joint initiative between two European Commission Directorate Generals—for the Environment (DGXI) and for Enterprise (DGIII)—as a blueprint for EPP harmonisation in Europe.¹

The concept was originally based on the issues highlighted in a report by Ernst & Young and the University of Sussex's Science Policy Research Unit (SPRU), which was commissioned by DGXI and published in March 1998 (Ernst & Young/SPRU 1998). Since then, several activities have helped to further develop the IPP concept. However, despite these developments, the debate on IPP is still very much at its initial stage and IPP needs to be further clarified and elucidated. The next major step in the development of IPP will be the green paper that is currently being prepared by DGXI and which is expected in December 2000 (a year behind schedule). Until then, it appears that DGXI will make no major decisions. In addition, there appears to be a 'wait and see' attitude among the majority of stakeholders, particularly business, as they wait for the publication of the green paper (Belmane and Charter 1999a).

5.2 Integrated product policy

This section covers the most relevant developments of the IPP initiative without attempting to cover all aspects or underlying issues associated with it. The section includes an examination of the definition, objectives and conceptual approach, principles and strategies, and building blocks proposed for IPP, and the instruments and measures that may potentially make up an IPP toolbox.

5.2.1 Definitions

As yet, there is no official definition of IPP. However, working definitions have been put forward for discussion. The first of these was in the *Integrated Product Policy* report (Ernst & Young/SPRU 1998: 8). This report proposed to define IPP as 'public policy which explicitly aims to modify and improve the environmental performance of product systems'. This definition was followed by a second definition advanced by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (Bundesumweltministerium für Umwelt, Naturschutz und Reaktorsicherheit [BMU]) as part of its background paper on product-related environmental policy, prepared for the May 1999 informal meeting of environmental ministers in Weimar, Germany (BMU 1999: 1). According to this publication, 'integrated product policy is public policy which aims at

1 DGIII subsequently dropped out of the process early on, leaving DGXI to continue alone.

or is suitable for continuous improvement in the environmental performance of products and services within a life-cycle context'. The new elements in this definition include:

- The addition of services
- An explicit statement of the life-cycle perspective
- The incorporation of the principle of continuous improvement

The major change in this definition is the inclusion of services, which represents a significant increase in the scope of IPP. Initially, the report by Ernst & Young and SPRU proposed a very narrow focus on physical products rather than on services. However, the IPP workshop in December 1998 identified the need to consider services as well, and this has been followed up in subsequent IPP discussions. The consequences of including intangible products (services) in the definition and scope of IPP will, at the very least, require a longer time-frame to formulate IPP strategies for services, as more research is needed to fill the significant knowledge gaps regarding the service sector and its environmental impacts. Of greater concern is the potential danger that the formulation of IPP may become unmanageable because of the high level of complexity of the issue.

The other changes in the definition (i.e. life-cycle thinking and continuous improvement) are not as major, in that they are explicitly stating what was already implied in the first definition. However, they also highlight the importance of the conceptual relationship between IPP on the one hand and quality and environmental management systems (EMSS) on the other.

5.2.2 Objectives and conceptual approach

Ernst & Young and SPRU propose that IPP should be a new field of policy in the EU, clearly limited to objectives that explicitly deal with resource efficiency and the environmental impact of products (Ernst & Young/SPRU 1998). The BMU and the Nordic countries take a different approach to IPP. According to the Weimar background paper (BMU 1999) and the proposal for a common Nordic IPP (COWI/ECON/ÖRF 1999), it is proposed that IPP should not be a stand-alone policy with its own separate objectives. Instead, IPP should be an overall framework for those parts of existing EU policies (environment, health, trade and industry, waste, chemicals, etc.) that are relevant to the environmental aspects of products and services. Furthermore, IPP should be based on existing EU environmental (and social and economic) objectives, such as those laid out in the EU Fifth Environmental Action Programme, with the ultimate goal being sustainable development. IPP should, therefore, be a policy framework for existing policies and objectives rather than a separate policy with its own objectives and targets.

The differences in these two conceptual approaches correspond to the two main tendencies in national EPP approaches found by Ernst & Young and SPRU: that is, the incremental and comprehensive approaches. In the incremental approach, an initial policy framework is developed, which is then incrementally filled in with specific product policies that are separate from existing policies and contain their own objectives and targets. Ernst & Young and SPRU take this approach in their report. In the comprehensive

approach, product policy is not seen as a separate and independent policy but as a framework to integrate existing policies and objectives with a product orientation. The Weimar background paper and the Nordic proposal take this approach.

5.2.3 *Principles and strategies*

IPP is to be based on three fundamental principles (BMU 1999; COWI/ECON/ÖRF 1999), namely:

- Market orientation
- Stakeholder involvement
- Life-cycle perspective

This means that IPP should work with the market and involve all stakeholders in continually improving the environmental performance of products and services from a life-cycle perspective. To do this, it is envisioned that IPP should develop an overall framework for all stakeholders in specific product groups to perform integrated product management (IPM) in a co-ordinated manner. IPM differs from IPP in that IPP is a strategy for governments and authorities to encourage IPM, whereas IPM concerns the actions and measures taken by the different stakeholders (e.g. suppliers, manufacturers, distributors, retailers, customers, waste collectors, recyclers, disposal firms, financial institutions, consumer and environmental organisations, etc.) involved in the life-cycle of a product (or service) (BMU 1999).

From this perspective, IPP can be seen as a way for governments and authorities to instigate, facilitate and/or co-ordinate the actions of stakeholders in the product life-cycle to improve the environmental performance of product services, whether this involves 'greening' their design and development, production, distribution, use or recycling and disposal.

5.2.4 *Building blocks*

The IPP building blocks represent common aspects of product-oriented environmental policy that have been observed in many national EPP approaches. The building blocks are composed of clusters of policy instruments that can be used in varying contexts to achieve the stated goals of the building block. Since product groups and their environmental impacts vary considerably, a building block approach, as opposed to a policy instrument approach, allows for the construction of consistent and integrated policies across varied product groups.

The *Integrated Product Policy* report (Ernst & Young/SPRU 1998) highlighted five key building blocks:

- Managing wastes (e.g. take-back obligations)
- Green product innovation (e.g. stimulating research and design [R&D] and ecodesign)

- Creating markets (e.g. public procurement)
- Transmitting environmental information (e.g. eco-labelling, product declarations)
- Allocating responsibility (e.g. producer responsibility)

The Weimar background paper (BMU 1999) added two more IPP building blocks:

- Sustainable consumption
- Chemicals management

In our opinion, the addition of these new building blocks adds confusion to what is still an emerging topic without adding significantly to the value of the building block concept. Both new building blocks were already covered under those proposed by Ernst & Young and SPRU. Furthermore, sustainable consumption could be considered one of the overarching concepts behind IPP rather than as just being one element in it. However, it is easy to see the political motivation for including these new building blocks as they add emphasis to important political objectives. For example, relatively little research has been carried out on the 'greening' of consumption, compared with the 'greening' of products, and much remains to be done to understand and gain experience in this issue.

5.2.5 Integrated product policy toolbox

Until now, product policy tools have generally been applied within national and regional EPP approaches in an unco-ordinated manner, which appears to have produced sub-optimal results. Eco-labelling is a good example of this. In certain geographical areas (e.g. Scandinavia, Germany) and product markets (e.g. white goods, laundry detergents, office paper) eco-labels have had an impact on the greening of consumption and product development. However, in the other locations and/or markets the results have been more questionable. For example, eco-labelling schemes have not been as successful in countries such as the United Kingdom, France and Belgium. This is largely because of the varying contexts in which the eco-labelling instrument has been applied and the presence or lack of supporting measures (governmental, non-governmental and within the supply chain), such as consumer education. It is now understood that such policy instruments rarely work efficiently if they are not part of a wider policy approach.

The IPP concept proposes to remedy this situation by applying a range of policy instruments in a co-ordinated, integrated and complementary manner. Therefore, in the example used above, education and information campaigns to raise customer awareness, along with other instruments, would be used in conjunction with eco-labelling to ensure the effectiveness of the scheme. Furthermore, it has been realised in stakeholder discussions (Belmane and Charter 1999b; DGXI 1998; Ernst & Young/SPRU 1998) that there will not be a 'one-size-fits-all' solution and that the mixture of instruments will need to vary depending on the product group, the objectives and the shape of the market. Policy instruments will, therefore, need to be applied on a case-by-case basis.

The instruments would come from a large toolbox of different policy instruments, ranging from voluntary agreements to direct legislation. (Table 5.1 gives examples of

Instrument	Including
Voluntary instruments	<ul style="list-style-type: none"> ▶ Voluntary agreements ▶ Self-commitments ▶ Industry awards
Voluntary information instruments	<ul style="list-style-type: none"> ▶ Eco-labels ▶ Product profiles ▶ Product declarations
Compulsory information instruments	<ul style="list-style-type: none"> ▶ Warning labels ▶ Information responsibility ▶ Reporting requirements
Economic instruments	<ul style="list-style-type: none"> ▶ Product taxes and charges ▶ Subsidies ▶ Deposit/refund schemes ▶ Financial responsibility
Regulatory instruments	<ul style="list-style-type: none"> ▶ Bans/phase-outs ▶ Product requirements ▶ Mandatory take-back

Table 5.1 **Examples of possible instruments in the integrated product policy toolbox**

possible instruments in the IPP toolbox.) This toolbox will not be exhaustive. New instruments should continually be developed to suit specific purposes and situations.

5.2.6 *Uncertainty surrounding integrated product policy*

There are still many questions and uncertainties surrounding IPP that need to be addressed. These include, among others:

- What are the objectives and best approach for IPP?
- What are the priorities?
- How will IPP be implemented?
- What implications will IPP have for different stakeholders: national and local governments and authorities, industry, consumers, retailers and environmental non-governmental organisations (NGOs)?

The question as to 'What is IPP?' is still being asked among stakeholder groups and a clearer vision and a practical interpretation of IPP needs to be formulated (Belmane and Charter 1999a; DETR 1999).

5.3 Environmental product policy: Denmark's approach

The Danish environmental product policy (EPP) approach illustrates how EPP can be tackled at a national level and provides lessons for IPP at an EU level. Denmark represents one of the leading countries in the implementation of national EPP programmes and is a good example of the comprehensive approach to product policy.

The objectives of the Danish EPP are:

- To intensify the development and marketing of cleaner products in order to reduce the total environmental impact from production, use and disposal of those products
- To consolidate the competitiveness of Danish trade and industry in a future market which increasingly brings environment into focus and calls for cleaner products (DEPA 1997)

An evaluation of Denmark's environmental policy by the OECD indicates that the relatively stringent Danish environmental policy does not pose barriers for economic competitiveness or growth and is actually considered to be an important sales argument for Danish industry.² Denmark's main work areas have included:

- Accumulation of know-how, methodology and competence
- Information tools
- Green taxes
- Subsidies
- Green public procurement
- Establishment of product area panels

These will each be discussed in turn.

5.3.1 *Accumulation of know-how, methodology and competence*

The Environmental Design of Industrial Products (EDIP) project, initiated by the Danish government, has had a budget of approximately Dkr40–50 million. The major outcome of the project has been the creation of a detailed environmental assessment tool for products, including supportive databases and software that can be used for product design and also software development.

5.3.2 *Information tools*

The Danish Environmental Protection Agency (DEPA) is working on an overall product information strategy. The Consumer Council and the National Consumer Agency of

2 Danish Environment online (June 1999): www.mst.dk/magazine/contents/index8.htm

Denmark are exploring the inclusion of environmental considerations into product comparisons and information on the environmental impact of different products. These information tools include:

- Environmental guidelines
- Eco-labels
- Environmental product declarations
- Environmental manuals

These are discussed below.

5.3.2.1 Environmental guidelines

These are designed to be an information tool for purchasing professionals and are intended to improve environmental decision-making. At the same time, they are intended to encourage suppliers to develop 'greener' products. There will be around 50 guidelines published by 2000 and they are widely distributed to public-sector purchasing managers. The guidelines mainly target products with significant environmental impacts (e.g. office equipment, office furniture, cleaning agents, paint, lighting, transport equipment, kitchen hardware and equipment, and food products) and describe the environmental issues that should be considered when purchasing. Information about undesirable substances is also included (DEPA 1998).

5.3.2.2 Eco-labels

There are two eco-labelling schemes in Denmark, the 'Nordic Swan' (also operating in Sweden, Norway, Finland and Iceland) and the EU 'Flower' eco-label. The Nordic Swan has worked successfully on the Danish market; however, the EU eco-label has not been a success. There is also a special eco-label for organic food (DEPA 1997).

5.3.2.3 Environmental product declarations

Product declarations aim to provide information about the most significant environmental impacts of a product during its life-cycle but not necessarily to provide information about the environmentally 'best' or 'worst' products on the market. It is not clear how these declarations will be used in the Danish environmental information strategy (DEPA 1997).

5.3.2.4 Environmental manuals

Manuals are intended to provide information to final users about how to use, maintain and dispose of a product. The Danish EPA is examining the need for environmental manuals among different product groups and whether there should be mandatory environmental manuals required for specific product groups: for example, washing machines (DEPA 1997).

5.3.3 Green taxes

There are several environmental taxes and charges in Denmark, mainly connected with raw materials (e.g. sand, gravel, clay) and products and waste (e.g. batteries, cars, leaded petrol, disposable tableware, light bulbs, chlorofluorocarbons [CFCs] and halons, and pesticides). In 1996 Denmark was considered to be at the forefront in the application of environmental taxes and charges (Oosterhuis *et al.* 1996). However, a recent report commissioned by the Danish EPA gave a mixed assessment of existing Danish product taxes and charges, reflecting success for some and yet failure for others that lacked data or that were set at an insufficient level to influence demand (COWI 2000). The Danish EPP action plan considered an inter-ministerial committee to evaluate existing green taxes and use the results when considering the development of new taxes and charges (DEPA 1997).

5.3.4 Subsidies

In 1999 the Programme for Cleaner Products was launched by the Danish government. It is intended to give subsidies for the development and marketing of cleaner products, including the development of know-how and methods for product development, greener marketing, and waste and recycling systems. The programme will run until 2002.³

5.3.5 Green public procurement

Since 1994 activities related to greener public procurement have been promoted in the Action Plan for Sustainable Public Procurement Policy. In 1995 the Danish government sent a memorandum on green public procurement to all state institutions and state-owned and state-controlled companies specifying that environmental considerations must be taken into consideration alongside price and quality factors. The preliminary results show that the memorandum has been positively received and has resulted in a change in purchasing behaviour.

5.3.6 Establishment of product area panels

The Danish EPA has established product area panels made up of relevant stakeholders within specific product groups. The stakeholders are brought together and given a free hand to establish a dialogue and to strengthen co-operation in order to facilitate the development and marketing of cleaner products. The first three pilot product groups were electronics, textiles and transportation. Each of the product area panels had developed an action plan by the end of 1999, with a list of initiatives, time-schedules and possible funding sources. For example, the electronics product panel developed the following initiatives (DEPAP 1999):

3 DEPA 1997; and personal communication with M. Hounum, Danish Environmental Protection Agency, 1999.

- Product development guidelines, containing developmental concepts and methods and criteria relating to component choice for use by electronics designers and developers
- Component data sheets, covering the environmental properties of electronic components
- International standards, mapping how environmental issues are incorporated in international standards
- Energy reduction, encouraging co-operation with research institutes and companies to set up a limited number of surveys and development projects aimed at demonstrating the relationship between competitiveness and energy reduction during use
- Recycling technology: to develop appropriate techniques and methods to increase the material recovery rate for electronics to above 90% in three years and to help promote the export potential of Danish recycling technology
- Communication with product developers, to organise conferences and seminars to raise the awareness of electronic product developers of ecodesign, to assess training needs and develop training activities, to incorporate the product development guidelines into the higher education curriculum, to involve the media in spreading the message and to develop a web page with information on the environmental properties of components
- Public procurement: to examine the information and financial resource needs of public purchasers in buying environmentally friendly electronics
- Labelling: to develop a simple labelling scheme for household purchasers that gives comparable information on life-cycle impacts, including design (content of hazardous materials), use (energy consumption) and disposal (disassembly and recyclability potential)

5.4 Integrated product policy: a different perspective

The debate on IPP is new and evolving, and DGXI has been seeking input from stakeholders for discussion on the further development of IPP. We would like to present our thinking as input in this process.

The Centre for Sustainable Design (CfSD) has evolved a much simpler perspective on IPP compared with the current DGXI approach. CfSD defines IPP as 'public policy aiming at greening the marketplace through the integrated use of supply and demand side tools'. In this context, and based on the principles of a life-cycle perspective and stakeholder involvement, the key building blocks are:

- Green(er) consumption
- Green(er) product development

From this perspective, IPP is a policy initiative that includes both the supply side and the demand side of the equation. Governments or policy-makers can influence both sides of this equation by using various instruments from the IPP toolbox. By using a mixture of supply- and demand-side tools, it is possible to stimulate, facilitate and co-ordinate various actors along the product chain to engage in activities to reduce the impact of products throughout the product life-cycle. Table 5.2 gives examples of supply- and demand-side measures.

It should be noted that the instruments listed in Table 5.2 are not exclusive to their particular side of the equation. They do overlap and feed back to each other, which are key attributes in the greening of the marketplace. For example, public purchasing has the dual effect of greening the consumption side as well as sending a strong signal to producers and product developers to supply greener products.

From this perspective, however, it can be seen that business has little control over the consumption side, except through brand, product or corporate communications (e.g. advertising). Because of this, there may be a misperception in business that IPP covers only the supply side (e.g. eco-product development). To avoid perception gaps, which are already starting to emerge, the continued and balanced use of a consultative approach by DGXI, incorporating a wide range of stakeholder input, will be essential.

Eco-product development (supply) side	Consumption (demand) side
<ul style="list-style-type: none"> ▶ Regulatory bans/phase-outs ▶ Product requirements (content, quality, performance) ▶ Take-back requirements ▶ Grants/subsidies for eco-product development ▶ Eco-design competitions/awards ▶ Environmental management systems (EMS)/product-oriented environmental management systems (POEMS) ▶ Standardisation ▶ Information and reporting ▶ Voluntary agreements 	<ul style="list-style-type: none"> ▶ Consumer information: <ul style="list-style-type: none"> – Eco-labels – Product profiles – Product guidelines – Information centres ▶ Indirect taxation ▶ Public purchasing ▶ Deposit/refund schemes

Table 5.2 Examples of supply- and demand-side measures

5.5 Integrated product policy and eco-product development

From a life-cycle perspective, the greening of the product development process is key to reducing many of the environmental impacts of products (and services). Therefore, the product design and development phase is a crucial issue for IPP, as many of the environmental impacts of products are determined at this stage (Ernst & Young/SPRU 1998; Oosterhuis *et al.* 1996). For example, products that are designed to be inefficient or difficult to dismantle and recycle limit the ability of downstream stakeholders, such as customers and recyclers, to reduce product-related environmental impacts.

However, at present, ecodesign has not been widely adopted by industry (Clark and Charter 1996), particularly among small and medium-sized enterprises (SMEs; Clark and Charter 1999), and eco-product development (EPD)⁴ is rarely found as an integral part of a company's business strategy. This is because many companies, on the one hand, lack knowledge of environmental issues and ecodesign strategies and tools and, on the other, feel little legislative, business-to-business or market pressure to incorporate environmental issues into their product development process.

This is likely to change with the broader implementation of product-oriented environmental policies, such as IPP, as they will act as drivers for greater EPD implementation. Pressures for EPD would come not only through the threat of possible new regulation but also, more probably, through market pressure from customer demands for greener products or through the supply chain from voluntary initiatives, such as environmental management systems (ISO 14001 or the EU Eco-management and Audit Scheme [EMAS]) and product stewardship.

Therefore, in a new IPP landscape, those who have developed EPD approaches will be better prepared for the opportunities arising from greener markets as well as for threats from new regulations and economic measures and demands from the supply chain.

Even without a fully articulated and implemented IPP at the EU level, national EPP approaches are moving fast.⁵ Furthermore, many product policy tools (e.g. greener purchasing, national eco-labelling schemes, consumer education, green taxes, 'producer responsibility', etc.) are being applied irrespective of overall EPP or IPP frameworks. This means that companies will have to be prepared for emerging policies in nation-states regardless of how IPP develops in the future at the EU level.

5.5.1 Focus on the electronics sector

The electronics sector represents an excellent example of the challenges facing IPP and EPD. The electronics industry has received considerable attention recently from policy-

4 Eco-product development can be defined as the integration of environmental considerations into the entire product development process, from product strategy and idea generation to reverse logistics and end-of-life management.

5 For example, with the statement 'We are not waiting for the EU' (Ahlner, Swedish Environmental Protection Agency, personal communication, 1999).

makers because of its rapid technological rate of change and subsequent high rates of product obsolescence and growing problems from waste products throughout Europe and other parts of the world. As a result of these problems, the sector is under considerable pressure from a number of proposed and already active environmental regulations at both the EU and national levels. At the EU level, the proposed Waste from Electrical and Electronic Equipment (WEEE) Directive and the Restriction on the Use of Hazardous Substances in Electrical and Electronic Equipment Directive are in the process of being passed,⁶ and there is a newly proposed 'New Approach' Directive from DGIII (Electrical and Electronic Equipment [EEE] Directive) focused on ecodesign issues. At the national level, a number of countries have already implemented legislation on waste electrical and electronic products and others have proposals drafted.

Owing in part to the intensity of policy initiatives already focused on the sector, DGXI has highlighted electronics as a key sector for potential IPP pilot projects (BMU 1999). This will mean significant pressure to incorporate ecodesign and eco-product development at the company level.

From CfSD's initial research in the electronics sector there appears to be the following key issues in EPD:

- Supply chain management
- Communications
- EPD and environmental management systems
- Innovation

5.5.1.1 Supply chain management

IPP discussions have not really directly addressed supply chain issues. However, supply chain management (SCM) is becoming more and more important in EPD. For instance, many electronics companies, especially in Western Europe, are no longer 'manufacturers' as much as they are 'systems integrators', and significant environmental impacts result from their supply chains.

Companies may influence their suppliers in a number of ways. For example, some business customers now demand that their suppliers are ISO 14001- or EMAS-certified (Barthel 1999), or they may send detailed questionnaires or work closely with them in training programmes. Box 5.2 contains examples of tools and strategies for supply chain (environmental) management.

As a part of the Ecodesign and Training for Manufacture, Use and 'End-of-Life' for SMEs (ETMUEL)⁷ project, the following points and questions have been raised in discussions with electronics companies regarding supply chain issues:

- 6 The European Commission adopted the proposed WEEE and Restriction of Substances Directives on 13 June 2000. They have now been sent to the EU Parliament and the Council of Ministers.
- 7 ETMUEL is a project run by CfSD and funded by the Adapt programme of the European Social Fund. It is a two-year training programme focusing on the implementation of environmental considerations in product development and design (ecodesign) in the electronics sector. Further details can be found at www.cfsd.org.uk/etmuel/index.html.

- Communicating environmental expectations through written policies and communication materials (letters, brochures, articles, web-based materials)
- Providing questionnaires or the carrying out of audits
- Organising supplier meetings
- Offering supplier training and providing technical assistance
- Carrying out collaborative R&D projects
- Restructuring relationships with suppliers (e.g. implementing 'reverse logistics')
- Demanding suppliers to be ISO 14001- or EMAS-certified

Box 5.2 **Tools and strategies in supply chain (environmental) management**

Source: Adapted from Lippmann 1999

- Regarding the international aspects of the supply chain, where are the majority of electronics component suppliers located? The CfSD's research shows that it has been hard to find component manufacturers based in the United Kingdom (Clark and Charter 1999). The work in the Danish electronics product area panels indicates that the majority of component manufacturers are in the Far East.⁸
- Should companies educate and train their suppliers worldwide (e.g. producing ecodesign checklists in Chinese) if they are going to reduce environmental impacts in national markets?
- Can suppliers worldwide comply with European standards? For instance, is it possible for a component manufacturer in South-East Asia to 'design for dismantling', as implicitly suggested by the proposed EUWEEE Directive (DGXI 2000)?
- Who should be responsible for raising awareness of environmental issues in electronics products? Research by DGXI (DGXI 2000) has also shown that among electronics component suppliers there is very little or no awareness about 'business and environment' issues, ecodesign, or even the proposed WEEE Directive.
- How is information to be passed down the supply chain? Are manufacturers of final products able to educate all their suppliers about environmental issues (when there may be thousands of components in the final electronic product or equipment), and what are the costs and benefits?
- How can the supply chain be harnessed to influence SMEs? The supply chain is potentially a powerful channel to influence SMEs to improve their environmental performance, since SMEs are more likely to listen to their customers (Clark and Charter 1999).

8 Personal communication with J. Jakobson, Danish Environmental Protection Agency, 1999.

5.5.1.2 Communications

Poor communications inside and outside companies have been major barriers to selling ecodesign (internally) or eco-products (externally). Generally, EPD has been an isolated activity within environmental management or R&D and has rarely been treated as a mainstream management issue.

Internal communication

A major obstacle to the development and management of 'greener' products (EPD) is that communication with customers is often carried out by the marketing and sales functions, which are two of the least 'green' business functions. In addition, marketing usually has significant influence on product decisions (Clark and Charter 1996). This has resulted in poor internal marketing of EPD to internal stakeholders (e.g. selling of ecodesign).

External communication

In order to establish customer needs, better dialogue with the market is necessary. Conventional market research has tended not to address environmental issues and this has led to a lack of knowledge about customer needs and expectations. For instance, Rank Xerox has two questions on environmental issues in the main yearly customer survey that have displaced two marketing questions. The environment director lobbied hard for the questions and has to report back on business benefits resulting from asking those questions (Charter 2000a).

Most EPD has focused on improving the internal eco-efficiency of the product, with little attempt to understand the use phase of products. Where this has been undertaken, there are cases of real eco-improvement. For example, with the Kambrook (Axis) kettle it was only when the researchers and designers observed how consumers used the kettle that they started to define environmental improvements (Sweatman and Gertsakis 1997; see also Chapter 16).

In addition to this, lack of awareness, lack of understanding and poor communication may be some of the reasons for the emergence of 'rebound effects'—the situation where improved environmental features in the product cause increased consumption. Good examples are light bulbs and washing machines, where cost savings have encouraged customers to increase consumption—e.g. to leave the lights on or to wash clothes more often (see Chapter 12).

5.5.1.3 Eco-product development and environmental management systems

EMSS, such as ISO 14001 and EMAS, have predominantly been focused on site-related issues. However, a number of companies are beginning to use their EMSS to focus on product-related issues and to implement ecodesign in their companies. The concept of linking EPD to EMSS is also the basis of the product-oriented environmental management system (POEMS) initiative in the Netherlands that aims to embed EPD in EMSS or broader management systems.

Separately, an ISO working group has organised a number of expert workshops to examine ways to integrate environmental aspects into product development. From these, it was concluded that there is a need for an ISO document that highlights environmental

aspects at each stage of the product development process—ISO 14062. A technical report ‘for information purposes only’ (Lehmann 1999) will be completed by the end of 2001. The working group agreed that the report should be informative and provide guidance to companies but should not be an ISO standard. Discussions are continuing within the ISO TC207 committee on environmental management systems and national standards bodies.

5.5.1.4 Innovation

Product innovations are considered to be necessary in order to expand and maintain a company’s market share (Oosterhuis *et al.* 1996). Innovation is one of the major business drivers for the electronics industry, combined with rapid technological change. For instance, market research in consumer electronics indicates that there is a need for fundamentally new products since in many Western European countries consumer electronics products have low volume growth and low profitability (RBI 1998). Innovation is a key challenge for industry if eco-efficiency (e.g. ‘factor 4’ and ‘factor 10’) goals are to be achieved. Therefore, it is important to explore how to combine innovation with EPP instruments that differ in relation to their ability to stimulate innovation. Subsidies for R&D probably have the most direct potential influence on eco-innovation, although other instruments (e.g. taxes and charges) may have an impact (Oosterhuis *et al.* 1996).

5.6 Concluding remarks

Nine major conclusions may be drawn.

1. The IPP approach is new, and discussions are still in their infancy. The main questions are:
 - What are the objectives and priorities of IPP?
 - How it will be incorporated in legislation and other policy measures?
 - How can the success or progress of IPP be measured?
2. IPP is a government policy approach to green the market by greening product development (supply) and consumption (demand). However, manufacturers have little or no control over the consumption side. Environmental product policies (EPPs) often appear to be focused more on the ‘greening’ of the supply side rather than on the consumption side. The recognition of the importance of the consumption side in achieving sustainability goals is becoming more and more important.
3. The majority of stakeholders have adopted a ‘wait and see’ approach to IPP until the green paper is published by DGXI (expected in December 2000).
4. The synergies and overall benefits resulting from IPP will be achieved through the integration of supply- and demand-side measures. The development of greener products without greener markets is sub-optimal.

5. Companies should develop their own EPD programmes, which can bring financial benefits and generate new ideas and business opportunities. However, the issue needs to be managed and new tools need to be developed to enable environmental considerations to be integrated into product development from the idea generation phase to the 'end-of-life' management (EOLM) phase. Companies with EPD in place will be better prepared for new policy developments (e.g. new market opportunities, product liabilities, etc.) that might emerge from the EPP or IPP debates at either national or EU level.
6. There seem to be several key issues in EPD: supply chain management, communications, links to environmental management systems (EMSs) and innovation:
 - *Supply chain management (SCM)*: SCM might provide a real opportunity to reduce eco-impacts since overall environmental performance is closely related to how EPD is managed up and down the supply chain. Additionally, supply chains hold a large potential to 'green' SMEs.
 - *Communications*: poor environmental communication both internally and externally has been one of the major obstacles to developing and promoting 'greener' products. Can IPP help to tackle these issues?
 - *Environmental management systems (EMSs)*: the integration of EPD into existing EMS schemes is being tried in the Netherlands (i.e. POEMS). Similar discussions are evolving within the ISO, where an ISO information and guidance document will be produced on EPD. However, it is too early to derive any major conclusions from these initiatives since the work has just started.
 - *Innovation*: innovation is an important business driver in the electronics sector as well as one of the key eco-efficiency challenges on the supply side. Eco-innovation should be regarded as one of the strategic elements in greening the supply side.
7. There are several ways that governments can help progress the EPD process, such as through funding and subsidies, public information and education campaigns, co-ordination of information flows and support for greener purchasing. It has also been realised that increased environmental considerations can result in competitive advantage so there is more room to link environmental requirements to industrial development.
8. It is important to remember that all stakeholders must 'buy into' the IPP process, since IPP is based on 'shared responsibility' rather than 'producer responsibility'.
9. The IPP at the EU level is progressing slower in comparison to national EPP approaches in different EU countries (e.g. Sweden, Denmark, Austria, Germany, the Netherlands) and non-EU countries (e.g. Japan, Norway). Therefore it is important for companies to develop and to continue to work on their own EPD programmes without waiting for developments at the EU level.