Study towards the Development and Dissemination of Best Practice on Sustainable Use of Biocidal Products

Final Report

3 October 2010

milieu
ENVIRONMENTAL LAW & POLICY

RPA

Hydrotox
LABOR FÜR
ÖKOTOXIKOLOGIE UND
GEWÄSSERSCHUTZ GMBH
FREIBURG

This Report has been prepared by Milieu Ltd, Risk and Policy Analysis Ltd. and Hydrotox GmbH for DG Environment of the European Commission under Study Contract No. 070307/2009/546211/ETU/D4. The authors are: Tony Zamparutti, Gretta Goldenman and Nienke van der Burgt of Milieu; Jan Vernon and Nigel Tuffnell of RPA; and Stefan Gartiser of Hydrotox. Florent Pelsy and Gavin McBride of Milieu provided inputs.

Milieu Ltd. (Belgium), rue Blanche 15, B-1050 Brussels, tel: +32 2 506 1000; fax: +32 2 514 3603; zamparutti@milieu.be; nienke.vanderburgt@milieu.be; web address: www.milieu.be.

Table of contents

Appendices

List of abbreviations

AISE	International Association for Soaps, Detergents and Maintenance Products
BAT	Best Available Techniques
BEP	Best Environmental Practice
BETA	Biodiversity and Environmental training for advisers
BAuA	Federal Institute for Occupational Safety and Health (Germany)
BfR	Bundesinstitut für Risikobewertung (Germany)
BPCA	British Pest Control Association
BPD	Biocidal Products Directive 98/8/EC
BREF	Best Practice Reference Document
CAs	Competent Authorities
Cefic	European Chemical Industry Council
CEN	Comité Européen de Normalisation
CIEH/NPAP	National Pest Advisory Panel of the Chartered Institute of Environmental Health (UK)
CIS	Common Implementation Strategy
COSHH	Control of Substances Hazardous to Health
COST	European Cooperation in Science and Technology
CRRU	Campaign for Responsible Rodenticide Use
CSES	Centre for Strategy and Evaluation Services
CSPa	Charter Sustainability Procedures
CSTEE	Committee on Toxicity, Ecotoxicity and the Environment
Defra	Department for Environment, Food and Rural Affairs (UK)
DSV	German Sailing Association
ECDC	European Centre for Disease Prevention and Control
EMCEF	European Mine, Chemical and Energy Worker's Federation
ESD	Emissions Scenario Document

ETUC	European Trade Union Confederation
GMB	National Union of General and Municipal Workers (UK)
GPPP	Good Plant Protection Practice
HACCP	Hazard Analysis and Critical Control Points
HICPAC	Infection Control Practices Advisory Committee
HPA	Health Protection Agency (UK)
HSE	Health and Safety Executive (UK)
IFC	International Finance Corporation (World Bank Group)
IFEH	International Federation of Environmental Health
IFH	International Scientific Forum on Home Hygiene
IMPEL	European Union Network for the Implementation and Enforcement of Environmental Law
INSHPO	International Network of Safety and Health Practitioner Organisations
IPPC	Integrated Pollution Prevention and Control
IPM	Integrated Pest Management
KPIs	Key Performance Indicators
LEAF	Linking Environment and Farming
LCC	Life-Cycle Costing
NAP	National Action Plans for the sustainable use of pesticides
NIA	Nanotechnology Industries Association
NRoSO	National Register of Sprayer Operators
NCHH	National Centre for Healthy Housing (US)
OSHA	Organisation for Health and Safety at Work (EU)
PAN	Pesticides Action Network
PITA	Paper Industry Technical Association (UK)
PT	Product type
PWTAG	Pool Water Treatment Advisory Group

RIVM	National Institute for Health and Environment (Netherlands)
RKI	Robert Koch-Institut (Germany)
RMM	Risk mitigation measures
SCENIHR	Scientific Committee on Emerging and Newly Identified Health Risks (European Commission)
TBT	Tributyltin
TGB	The Green Blue (UK)
TRBA	Technical rules for biological agents (Germany)
TRGS	Technical rules for hazardous substances (Germany)
TUC	Trades Union Congress (UK)
TWG	Technical Working groups
UBA	Federal Environmental Agency (Germany)
UCATT	Union of Construction Allied Trades and Technicians (UK)
UNESDA	Union of European Beverages Associations
US EPA	US Environmental Protection Agency
VI	Voluntary Initiative (UK)
VDI	Verein Deutscher Ingenieure (Germany)
WEEE	Directive on Waste Electrical and Electronic Equipment
WFD	Water Framework Directive
WPA	Wood Protection Association (UK)

Executive summary

This Final Report sets out the results of the *Study towards the development and dissemination of best practice on sustainable use of biocidal products*, undertaken by Milieu Ltd, Risk and Policy Analysis Ltd. and Hydrotox for DG Environment of the European Commission.[1]

The aim of the study, as per the Technical Specifications for the work, is to identify existing best practices that have been developed by the competent authorities of Member States or by industry (stakeholders) for the 23 biocidal product types identified in Directive 98/8/EC, in order to ensure a sustainable use of biocidal products. More specifically, it should provide the Commission with information regarding:

- the approaches towards best practices on the use of biocidal products at Member States level,
- the best practices linked to the use of biocidal products developed and promoted by the industry, and
- the way how the concept of best practices could be best adapted and used at Community level.

Policy background

The 2006 *Thematic Strategy on the sustainable use of pesticides*[2] was accompanied by a proposal for a Framework Directive on the sustainable use of pesticides[3], which was adopted in 2009 as Directive 2009/128/EC establishing a framework for Community action to achieve the sustainable use of pesticides (Sustainable Use Directive). The Sustainable Use Directive defines "pesticide" as (a) a plant protection product as defined in Regulation (EC) No 1107/2009 and (b) a biocidal product as defined in Directive 98/8/EC.[4] However, the scope of the Sustainable Use Directive, as set forth in its Article 2, makes it clear that the Directive applies only to plant protection products, and it was adopted together with Regulation (EC) No 1107/2009 concerning the placing of plant protection products on the market (PPP Regulation).

The review of Directive 98/8/EC concerning the placing of biocidal products on the market has resulted in a proposal for a new Regulation on biocides that is going through the EU legislative process: this proposal aims to establish more harmonised rules in relation to the approval of active substances and the placing on the market and use of biocidal products. While the proposed Biocidal Products Regulation (currently under discussion in the co-decision procedure) contains provisions on the use of biocides, the issue of sustainable use remains largely outside its scope.[5]

A 2008 study for the European Commission explored options to address risks from the use phase of biocides.[6] The current study follows up on one of the options presented in that earlier work, the use of best practice documents to promote sustainable use.

During the course of the study, the team used the following criteria for selecting potential best practice documents:

[1] Study Contract No. 070307/2009/546211/ETU/D4.
[2] COM(2006) 372 final.
[3] COM(2006) 373 final.
[4] Article 3(10) of Directive 2009/128/EC.
[5] Commission proposal of 12 June 2009, COM(2009)267
[6] COWI, *Study on Assessment of Different Options to Address Risks from the Use Phase of Biocides*, 2008.

Criterion: Best practice	Sub-criteria
Scope	Focus on the use phase of biocidal products
Ambition	Guidelines seek to reduce risks (from use phase in particular)
	Guidelines seek to provide technical understanding and detailed best practice
Development	Involvement of stakeholders in development
Wider applicability	Potential for expansion to EU as a whole. Potential international standard.

Defining 'best practice' on 'sustainable use of biocidal products'

During the course of the study, the need for a working definition of "sustainable use of biocidal products" as well as further clarification of the term 'best practice' became clear. The definition of "use" provided in the proposed Biocidal Products Regulation is product-centred, which corresponds to the aim of the proposed Regulation – to determine levels of acceptable risk related to a biocidal substance, based on a product formulation and its application.

"Sustainable use" is a broader concept that considers the use of biocides in general, along with the overall risks posed by all biocidal product use, and aims at the overall least impact on human health and the environment. It considers the three pillars of sustainability (economic, social, environmental) at the various points when decisions are taken concerning how to achieve the desired objective of preventing or controlling the growth of harmful organisms or of materials preservation, etc. Thus it goes beyond acceptable risk to seek any additional opportunities for further risk reductions that can be achieved while ensuring effective action against harmful organisms. This provides a further margin for ensuring least possible impacts on health and environment; it may also lead to cost savings, thereby addressing the economic pillar of sustainable use as well.

Sustainable use thus highly depends on the course on the decisions taken by the individual operator at the various decision points. This emphasis on decision points is also followed in the application of integrated pest management (IPM). Important decision points include consideration of long-term measures aimed at prevention, use of thresholds in combination with monitoring of harmful organisms to determine when an intervention is needed, and the choice of which control option to apply.

The definition of IPM in the Sustainable Use Directive refers to the need for "careful consideration of all available methods" as well as "other forms of intervention", and therefore goes beyond a product-centred approach. Moreover, it incorporates the three pillars of sustainable development ("economically and ecologically justified;" "human health and the environment"). It is however important to acknowledge that it is not a straight-forward task to apply IPM methods across the range of non-agricultural pests and other harmful organisms. Although the IPM approach provides significant overlap with the concept of sustainable use, IPM is not necessarily sustainable use.

In applying these considerations to what constitutes "best practices" for sustainable use of biocidal products, the following key elements were identified:

- Going beyond existing EU regulatory standards
- Balanced consideration of all three pillars (economic, social, environmental) of sustainability
- Reducing risks from the use of biocides by minimising and/or eliminating exposure, including use of less harmful, including non-chemical, alternatives

Thus, best practice for sustainable use focuses less on the concrete product and places more weight on the points where decisions related to control of harmful organisms are taken. It involves a consideration of economic, social and environmental aspects at those various points. It gives priority to non-chemical pest

control methods first and turns to biocidal products only when alternative approaches or techniques are not sufficient to keep pests below the thresholds where economic damage occurs or health concerns are significant. Finally, when it is necessary to use biocidal products, best practice means using the least amount required to return the pest population to below threshold of damages with economic significance.

Overview of best practice documents currently in use

The study gathered information on existing best practice documents prepared by Competent Authorities (CAs) and by a variety of stakeholders. In order to reduce the burden of requests on CAs and others, the study team gathered this information through a three-stage process:

- Stage 1: Identifying possibly relevant guidelines through web searches and initial questions to CAs and stakeholders
- Stage 2: Characterising these documents in terms of a series of key categories (e.g. product type; focus on professional or consumer use; web address) and then checking data with the organisations preparing the guidance
- Stage 3: Investigating the methods used to develop, disseminate and monitor best practice documents – here, information was gathered in a set of in-depth interviews

Through the first and second stages, a total of 471 possibly relevant documents were identified. These documents were prepared by a broad range of organisations:

- Government bodies in the Member States : over one-third of the documents were prepared by Member State bodies. Despite contacts with all Member States, relevant documents were identified in only 11 of the 27 Member States and two of these – Germany and the UK – accounted for the overwhelming majority of documents prepared by Member States.
- EU institutions
- International organisations such as WHO
- Government bodies in selected countries outside the EU (in particular Canada and the US)
- Industry associations in both Member States and at EU level
- Professional associations in Member States
- Standards organisations in Member States and at EU and international levels
- Corporations
- NGOs
- Others, including academic organisations.

A review by product type then identified potential best practice documents that appear to go beyond current legal requirements and, moreover, cover elements of sustainable use. (It should be noted, however, that most of the documents identified as potential best practice refer to one or two elements of sustainable use rather than the concept as a whole.)

Table 1 provides an overview of the documents identified and analysed. Column 1 shows the total number of all documents identified per product type through the first two stages of information gathering. Column 2 shows the number of documents that were subsequently identified as potential best practice. Most potential best practice documents are destined for industry and professional users (column 3), and many of these present standards for use in industry (column 4). For most PTs, fewer potential best practice documents are oriented towards the public and consumers (column 5) than towards industry and professional users. Moreover, many of the documents identified for the public and consumers also refer to industry and professional users and thus are counted in both columns 3 and 5. It should also be noted that many documents refer to more than one product type and thus are counted in more than one row.

Table 1: Potential best practice documents

PT	1. All documents identified	2. Potential best practice documents	3. Documents for industry/ prof. users	4. Of which, standards	5. Documents for public/ consumers
1	58	**36**	**36**	4	4
2	153	**59**	**55**	**32**	9
3	19	16	16		**16**
4	53	20	20	9	3
5	17	4	4	2	3
6	11				
7	10				
8	79	**37**	**37**	**22**	**16**
9	8	1	1	1	
10	15	1	1		
11	17	9	9	4	
12	11	1	1	1	
13	32	11	11	6	
14	89	**41**	**32**	3	**14**
15	24	2	2		
16	15	n.a.	n.a.	n.a.	n.a.
17	16	2	2		
18	96	20	18	10	3
19	42	11	9		8
20	4	n.a.	n.a.	n.a.	n.a.
21	25	14	13	3	7
22	7	2	2		
23	24	6	6		
Cross-cutting	30	17	14		**10**

Notes:
n.a. = not assigned (this is the case for PT16, where no active substances have been submitted for the review programmes, and PT20, which would be removed under the proposed Regulation to replace the Biocidal Products Directive).
Categories with a high number of documents are in **bold** – specifically, those with 30 or more potential best practice documents; 30 or more documents for industry or professional users; 20 or more standards; 10 or more documents for public/consumers.

A high number of potential best practice documents were identified for the following product types: PT1, PT2, PT8 and PT14. For all four PTs, a high number of potential best practice documents are intended for industry and professional users. For PT2 and PT8, a high number of technical standards have been developed. A high number of potential best practice documents for the public are seen for PT3, PT8 and PT14. In addition, a high number of cross-cutting documents for the public were seen.

A comparison of the number of documents for each product type to the risks related to the biocides (using results from the 2008 study) identified four PTs for which a relatively small number of documents have been developed:

- PT10 – Masonry preservatives
- PT11 – Preservatives for liquid cooling and processing systems
- PT18 – Insecticides, acaricides and products to control other arthropods
- PT21 – Antifouling products

The analysis also identified a gap in terms of documents that focus on microbial resistence. Some documents for PT2 biocides address this issue; none of the cross-cutting document, however, do so.

Developing, disseminating and monitoring best practice documents

The follow-up interviews gathered in-depth information on:

- the reasons for preparing these guidelines,
- the approaches used in preparation
- the methods for dissemination
- mechanisms to monitor the uptake and results of the best practices
- links between best practice documents and the regulatory structure
- the costs and benefits of best practices

These interviews provide a good overview as well as concrete examples of the different approaches to the phases of development, dissemination and implementation of best practice.

Developing best practice: objectives and participation

The protection of human health is the most common *objective* for best practice documents. Documents typically follow two main approaches: the effective use of biocides against harmful organisms; and the reduction of human exposure to biocides; a number of documents pursue both objectives. The protection of the environment was another frequent, though less common, objective. Many of the best practice documents destined for professional users or industry also sought to reduce costs, in some cases via the reduction of the volumes of biocide consumed. None of the interviews cited sustainable use as objective, though as seen above the objectives of the best practice documents considered cover key elements of this concept.

By and large, the organisations contacted had *consulted* with a number of stakeholders when preparing their guidance. For example, most government bodies involved outside stakeholders, using methods ranging from small working groups to open public consultation. Interestingly, few government bodies mentioned cooperation with other parts of government.

Most of the industry associations, standards bodies and other groups outside government that were contacted for the study consulted with other stakeholders, with experts and also with government bodies.

Dissemination

A key distinction is made between the dissemination of best practice documents intended for professional users and those for the general public. Dissemination methods for professional users were disseminated through a broad range of techniques, such as:

- Websites
- E-mails to interested parties or hard copies on request
- Agreements with associations (distribution to members)
- Industry fairs/exhibitions
- Press releases
- Via EU organisations active on biocidal products
- Workshops, seminars and technical training.

For the general public, dissemination via the web is common. In a few cases, other methods were used, including the distribution of a brochure with a consumer magazine; in a few cases, innovative approaches such as computer-based games have been used to raise awareness among specific groups, such as young people.

Monitoring and evaluation

The interviews revealed that few efforts were made to monitor the uptake and results of best practice guidelines. Some organisations track the distribution of the documents (such as number of web downloads), and a number gather informal feedback from stakeholders. In one case, an NGO carried out a survey of the influence that its document for boaters had on their behaviour concerning antifoulants PT21 (as well as other areas not related to biocides).

Despite the lack of monitoring, several best practice documents prepared by government bodies for industry and professionals are linked to the regulatory structure, and their implementation by a facility may be considered during inspections: this is the case for example for some of the documents prepared by the Health and Safety Executive in the UK. In Germany, some best practices developed by industry associations for enterprises are considered in inspections by worker health and safety insurance schemes.

Risk reduction, costs and savings

A number of interviewees indicated that best practice documents had resulted in a reduction of risks to human health or the environment. They based their assessments on several sources, such as informal feedback from users; no quantitative estimates were provided.

Several interviewees – from both government and private organisations – also considered that documents had led to cost savings for professional users, for example due to:

- Reduction in the amount of biocidal products used
- Reduction of ill health
- Improved compliance with legal requirements
- Reduced liabilities, improved regulatory compliance and reduced litigation.

No interviewees were able to provide quantitative estimates of the cost savings, however. A few interviewees noted that the adoption of some best practice documents led to costs for users such as industrial facilities, for example for training and for changing procedures.

The respondents also provided some information on the cost of developing and disseminating best practice documents – this information has been used for the study's preliminary cost estimates.

Links to the regulatory structure

While best practice documents are not legally binding, in many cases they are linked to national regulatory structures. As described above, the implementation of such documents is considered during facility inspections in the UK. In such cases, documents provide detail to help industry and professionals implement regulatory requirements. In other cases, best practices can fill in gaps in the law. Some best practice documents are linked to regulatory requirements for training: this is the case, for example, in the US requirements calling for IPM training for pest control applications in public housing. In other cases, best practice documents are developed as a means to implement national programmes to reduce pesticide and biocide use: this is the case, for example, in Belgium.

Examples of best practice in other policy areas

The study also reviewed experience from other policy areas. The examples were chosen from both environmental policy and other policy areas such as health, drug abuse prevention and worker health and safety.

Legal/institutional role of guidance

In these examples, most of the best practice approaches are linked to the legal structure or to policy goals. In some cases, the best practices documents are an important element of work for the implementation of legislation, although their use remains voluntary. This is the case for the guidance documents developed under the Water Framework Directive. Other initiatives, such as industry guidelines on marketing soft drinks, have been developed as an alternative to binding legislation: in this instance, the European Commission indicated that binding legislation would be considered if industry did not undertake its own initiatives.

Best practices are also used as a non-regulatory approach to implement policy goals, as in the case of the UK Voluntary Initiative for pesticides.

Commitments and participation

Many initiatives developed by industry associations require participating companies to make a commitment to the guidelines. Some of these initiatives have explicit reporting mechanisms. Other initiatives do not require specific commitments. In these cases, there is little information available on the uptake and results of the guidance.

Public information

In nearly all cases reviewed, the guidelines are made publicly available as well as information and where available monitoring results related to their implementation.

Options for EU actions to promote best practice guidelines for sustainable use

Based on an analysis of the information gathered, including current actions to promote best practices at EU level as well as the activities reviewed in other sectors, the study identified a set of possible policy options for the European Commission to consider in terms of how the concept of best practices could be adapted and used at the Community level.

In total, 14 options are proposed. Of these, 12 would not require changes to EU legislation. The options are categorised in terms of the main stages in the development and promotion of best practice documents: development, dissemination (including training) and monitoring/evaluation. Each option is presented separately; however, many are complementary and three "packages" of options are proposed (see Section 5).

An estimate of the costs of these options has been developed (see Section 6). Due to the lack of quantitative information on benefits, however, these have not been valued and instead are outlined in a qualitative terms. Table 2 below lists the options, their costs and their benefits.

Table 2: Potential benefits associated with each option

Options	Costs	Benefits
Options to strengthen the development of best practice (without legislative changes)		
Option 1: EU-funded background research (per project per year)	No additional cost (funded through existing programmes)	• Increased knowledge of the impacts of biocides on target organisms, the environment and human health • A basis to prioritise any further action • Provision of the knowledge required to improve best practice on sustainable use of biocides use.
Option 2: EU-level procurement process to develop guidelines	€0.2 to €1.6 million (depending on number of documents and languages)	• Increased availability of best practice • Standardisation and harmonisation of best practice across EU.
Option 3: National best practice transferred to EU-level	€1.1 million to €19.6 million (depending on number of documents and languages)	• Making existing best practice guidance more widely available, by translating it into a range of EU languages • Encouraging harmonisation of best practice across EU.
Option 4: Best practice developed by stakeholders through standardisation process	No net cost; recouped through sale of standards	• Wider availability of best practice guidance, via the communication networks of CEN and national standards authorities • Standardised best practice across EU.
Option 5: Addressing biocides within the BREFs under IPPC	€0 to €22.5 million (depending on whether carried out as part of normal revision or through separate revisions)	• Integration of biocides best practice into EU wide guidance for major industrial operations (i.e. all relevant guidance in one place) • Enhanced focus on best practice use of biocides by enforcement authorities • Standardised best practice across EU.
Dissemination		
Option 6: EU public information campaign	€1.2 million to €7.3 million (including industry supporting campaign)	• Greater public and industry awareness of biocides and the issues (human and environment health, safety and sustainability) that surround their use • Greater stakeholder awareness of best practice guidance • Greater stakeholder awareness of how to obtain best practice guidance • Provision of information/educational tools for use by other organisations (videos or interactive media developed to support the information campaign could be used by industry for training purposes).
Option 7: EU-wide web site	€1 million plus €0.1 per year for maintenance	• Greater public and industrial EU-wide access to information on biocides and the issues (health (human and environment), safety and sustainability) that surround their use • EU-wide source of best practice guidance.
Option 8: National web site	€1.8 million to €32.4 million plus €0.3 to €3.5 million per year for maintenance (depending on degree of separate national content)	• Greater public and industrial awareness of biocides and the issues (human and environmental health, safety and sustainability) that surround their use • Local use patterns and legislative variations will be covered (not for web sites that simply translate an EU-wide web site (Option 7)) • Guidance will be available in users' own national language • Greater availability of best practice guidance in general.

Options	Costs	Benefits
Option 9: Helpdesks to provide information on best practices	€0.5 to €0.8 per year (EU wide helpdesk) €10.8 to €21.6 per year (27 national helpdesks)	• Could provide users of biocides with an easy point of access to information on best practices in the sustainable use of biocides • Could provide more in-depth and focused information than the web site • An EU-level help desk could provide consistent guidance on best practices across Member States (perhaps developed under Options 3 and 4) • National help desks could provide explanations of local use patterns, industry structures, training availability and legislative requirements • On a national help desk, guidance would be available in users' own national language • National help desks could provide user specific guidance and respond to user concerns or problems.
Links to policy structure		
Option 10: Include biocides in the NAPs for the sustainable use of pesticides	Below €0.3 million per year to authorities Costs to users cannot be quantified	• Involvement of a wide range of national stakeholders • The existing consultative and other structures developed for pesticide use would provide a 'ready made' set of structures for biocides • NAPs could provide a strong mechanism for encouraging the adoption of best practice in industry and among professionals and raising awareness among the public.
Option 11: Create a working group to support sustainable use	Re-imbursement of expenses, only	• Support for the standardisation of best practice across the EU • Support for the dissemination and use of best practices across the EU • Support for the provision of best practice guidance from other options (e.g. by providing a forum for reviews of new best practice guidelines for EU level, such as those developed under Option 2 or reviewing plans for an EU web site (Option 7)) • Support for the consideration of other options, beyond best practices, for promoting sustainable use • Would provide a forum for bringing forward sustainable use at EU level.
Option 12: Use information gathered during the biocidal product authorisation process	No additional cost – can be carried out within other options	• Makes use of information which is being generated anyway, under the authorisation process, to feed into the development of best practice guidance.
Policy options that involve legislative changes: Dissemination		
Option 13: Training and certification	Costs cannot be quantified	• Potential cost savings through reduced use of biocides • Reduced risks of damage to the environment or health.
Policy options that involve legislative changes: Monitoring		
Option 14: Reporting on the use of biocides	Costs cannot be quantified	• Could identify areas where the use of biocides may pose the highest risks and thus the best opportunities for the promotion of sustainable use.

1 Introduction

This Final Report for the *Study towards the development and dissemination of best practice on sustainable use of biocidal products*[7] describes the main results of the work.

This introductory section provides a summary of the objectives of the study, briefly outlines the policy context for the study, and describes how the final report is structured.

1.1 Objectives of the study

The aim of the study is to help identify existing best practices that have been developed by the competent authorities of Member States or by industry (stakeholders) for the 23 biocidal product types identified in Directive 98/8/EC, in order to ensure a sustainable use of biocidal products.

The Commission highlighted in its Technical Specifications that in its view, in the context of the sustainable use of biocidal products, two main obstacles stand in the way of a better exploitation of the potential offered by best practices. One of these obstacles is the lack of an EU-wide overview of best practices. In addition it appears that there is little exchange of best practices among the competent authorities and industry.

The Final Report first provides an overview of the best practice guidance documents developed and used by Member States and stakeholders. Based on the identified potential best practice documents, the study investigates in more detail the approaches in these documents concerning best practices on the use of biocidal products (development; dissemination; and monitoring/evaluation). Among its results, this study confirms the concerns cited above regarding obstacles. It did not identify any EU-wide overview on best practices – in general or per product type. Moreover, except in Germany and the UK, little exchange is taking place between competent authorities and industry on best practices.

A further objective of this study is to provide insight in how the concept of best practices could be best adapted and used at the EU level. To assist the Commission to decide on the possible role that best practices can play in future policy on the sustainable use of biocidal products, the study identifies how the concept of 'best practice on sustainable use' relates to the existing and future regulatory framework of biocidal products. To achieve this objective, the meaning of 'best practice' in the context of 'sustainable use' of biocidal products is subject to discussion. Moreover, the study identifies a range of options for ways in which best practice guidance could be linked to the current and potential future regulatory framework for biocidal products, taking into account potential costs and benefits, administrative requirements, and timescales.

1.2 Project methodology

1.2.1 Approach to information gathering

Task 1 (Identification of best practice at Member States level) and Task 2 (Identification of best practice by industry and other stakeholders) aimed at mapping the various approaches (policies, instruments or programmes) of the 27 Member States and stakeholders towards the use of best practices as a tool to achieve or contribute to the sustainable use of biocidal products.[8]

[7] The study was conducted by Milieu Ltd, Risk and Policy Analysis Ltd. and Hydrotox for DG Environment of the European Commission under Study Contract No. 070307/2009/546211/ETU/D4.

[8] The first five months of this project were dedicated to information gathering for both Task 1 and Task 2.

For both tasks, information gathering followed a staged approach; this was developed to reduce the extent of information requests to Member State competent authorities and to other stakeholders, and thus to cope with the problem of "questionnaire fatigue". The Commission provided a mailing list of competent authorities. The list of stakeholders for the review was identified in the inception phase of the study, in consultation with Commission services.

The first step of information gathering was a literature review. Here, the project team reviewed the results of previous studies for the European Commission and searched for information on the Internet and through other sources. The information gathering work searched for possibly relevant documents from a broad range of stakeholders. These included the following types of organisations:

- Government bodies in the Member States
- EU institutions
- International organisations
- Government bodies in selected countries outside the EU
- Industry associations
- Professional associations
- Standards organisations
- Corporations
- NGOs
- Others

The literature review was closely tied to the study's consultation process, which was divided into three stages, in order to reduce the burden on competent authorities and stakeholders:

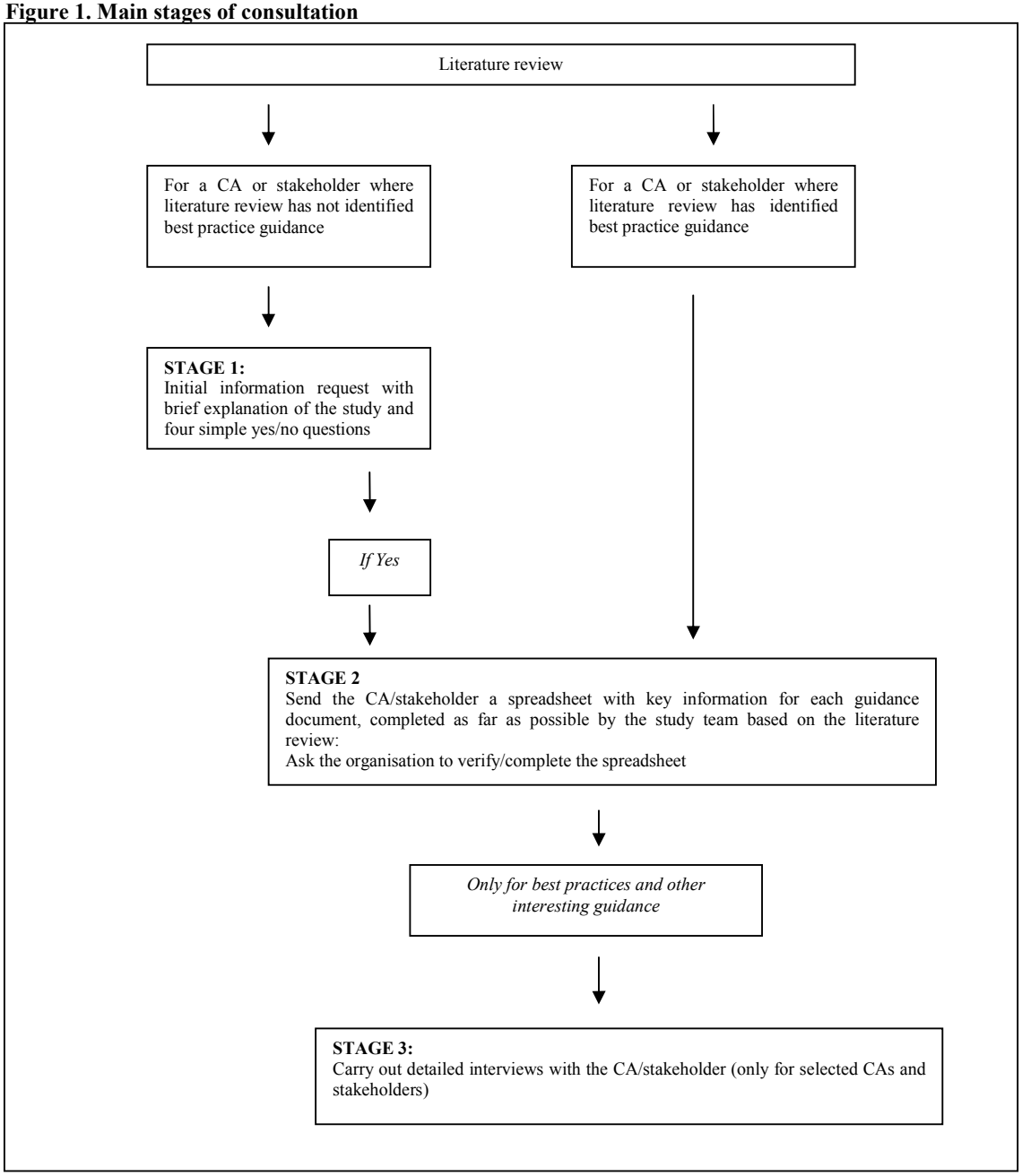
- Stage 1: Identifying best practice guidelines
  Where the literature review did not identify any best practice guidance prepared by the authority or other stakeholder, the project team sent an initial email with a brief explanation of the study, a definition of 'best practice' and four simple questions requesting information on best practice documents. If the respondent did not provide information or indicated that their organisation had not prepared relevant documents, no further contacts were made. (The questions used in this and the other stages can be found in the appendices to this report.)

- Stage 2: Characterisation of the guidelines
  Where guidance documents prepared by a government body or a stakeholder were identified in the literature review, the project team then sent a copy of the initial analysis spreadsheet, completed as far as possible, asking for a review and for any additional information (including additional guidance documents) where relevant. In these cases, a Stage 1 request was not made – the contact went immediately to Stage 2. In those cases where respondents had been contacted in Stage 1 and provided a list of documents in their response, these were entered in the initial analysis spreadsheet, which was sent back for review.

- Stage 3: Characterisation of the process
  The third stage involved a more detailed set of questions to gather information where specific types of best practice appear particularly relevant for the project. This stage used interviews to gain better insight in the 'why' question of best practice on sustainable use: what have Member States and stakeholders sought to achieve with their guidance on sustainable use of biocidal products and why have they sought to achieve this. Detailed questions were asked about the reasons for developing best practice, the methods used in development, any evaluation of their results as well as further information. The questions were structured around the different stages of development of best practice (development; dissemination; and monitoring/evaluation).

This staged consultation approach is illustrated in Figure 1 below.

Figure 1. Main stages of consultation



1.2.2 Overview of the consultation process

Member State consultation

Nearly all Member States were contacted in the first stage: for the two exceptions, Austria and Germany, the study team started contacts in the second stage. The first stage was relatively successful: all but 9 Member States of the 25 contacted responded. As most respondents indicated that best practice documents were not

prepared, a far smaller set of Member States were contacted in stages II and III. Table 1.1 provides an overview of the consultation results for Member States.

Table 1.1 Overview of Member State consultation process

Member State	Stage I (initial written questions)		Stage II (list of documents for review)		Stage III (detailed interviews)
	Questions sent	Response received	List sent	Response received	
AT			✓	✓	
BE	✓	✓	✓		✓
BG	✓	✓			
CY	✓				
CZ	✓				
DE			✓	✓	✓
DK	✓				
EE	✓	✓			
EL	✓				
ES	✓	✓			
FI	✓	✓			
FR	✓	✓	✓		
HU	✓				
IE	✓	✓			
IT	✓	✓			
LT	✓	✓			
LU	✓				
LV	✓	✓			
MT	✓	✓	✓	✓	
NL	✓	✓			✓
PL	✓				
PT	✓	✓			
RO	✓	✓			
SE	✓	✓			
SI	✓	✓			
SK	✓				
UK	✓	✓	✓	✓	✓

Consultation of industry and professional associations, standards organisations, companies

Before the first stage of the consultation for Task 2, 67 industry and professional associations, standards organisations and individual companies were contacted by email to request information on guidance produced by them or which they have knowledge of. Concurrently, a web-based search for documents was carried out. Some of the organisations contacted forwarded information on the consultation to other organisations. The number of organisations that were consulted is set out in the table below by Member State. In addition to these, a further 18 organisations had EU-wide representation, 12 represented wider international organisations and 1 was a professional body based in New Zealand. In total, almost 90 organisations were consulted or provided information.

Table 1.2 Number of industry, professional associations and standards organisations that were contacted for information, categorised by Member State

MS	No.	MS	No.	MS	No.	MS	No.
AT	**0**	FI	**0**	LV	**0**	RO	**0**
BE	**4**	FR	**5**	LT	**0**	SK	**0**
BG	**0**	DE	**10**	LU	**0**	SI	**0**
CY	**0**	EL	**0**	MT	**0**	ES	**2**
CZ	**0**	HU	**0**	NL	**0**	SE	**1**
DK	**0**	IE	**0**	PL	**0**	UK	**32**
EE	**1**	IT	**1**	PT	**0**		

Table 1.2 shows that most of the guidance identified originates from industry and professional associations in a small number of countries, and in particular from Germany and the UK. This suggests that the production of best practice documents is highest in these two countries. It should nonetheless be noted that the study team has good professional contacts in these two countries, due in part to previous work in this field, and this may have influenced the results.

Consultation with trade unions

The study team searched for guidance prepared by trade unions and contacted seven trade union organisations. The following trade unions were contacted:[9]

- ETUC
- GMB
- Prospect
- TUC
- UCATT
- Unison
- Unite

This literature search and consultation did not identify any guidance documents produced by trade unions. However, one trade union offered to forward the request for information to its members, and this resulted in industry responses that may not otherwise have been obtained.

Consultation of international organisations and governments outside the EU

The study team also searched for documents by EU agencies, government bodies in selected non-EU countries (in particular OECD countries including Canada and the US) and international organisations. In the consultation phase, the following bodies were among those contacted:

- European Centre for Disease Prevention and Control (ECDC)
- Health Canada
- International Forum on Home Hygiene

[9] Prior to consultation, we understood that the European Trade Unions Confederation (ETUC) were representing EU trade unions on policy with regard to biocidal products. To confirm this understanding, we contacted officers at a number of UK unions based on contacts obtained from previous studies. We also used the opportunity to ask these officers to contribute to our information gathering. The union officers were able to confirm the role of the ETUC but were not able to provide additional information of use to this study.

- Innovative Vector Control Consortium
- International Federation of Environmental Health (IFEH)
- International Maritime Organisation (IMO)
- International Network of Safety and Health Practitioner Organisations (INSHPO)
- OECD
- OSPAR
- The World Bank
- UN FAO
- US Environment Protection Agency (US EPA)
- US National Center for Healthy Housing
- WHO

The literature review also identified articles and books as well as some documents prepared by universities, both within the US and in other countries.

1.2.3 Analysis of the identified guidance documents

The review of documents took place over three stages.

After the available guidance documents on the use of biocidal products were identified and categorised in the assessment matrix: this led to a database consisting of 471 possibly relevant documents. The next step was an initial comparison. The objective of this first stage, the screening process, was to provide an overview all documents gathered

The second stage selected documents that could potentially be considered as best practice. In order to conduct this analysis, a series of evaluation criteria were prepared. The main criteria used are as follows:

Criterion	**Sub-criteria**
Scope	Focus on the use phase of biocidal products
Ambition	Guidelines seek to reduce risks (from use phase in particular)
	Guidelines seek to provide technical understanding and detailed best practice
Development	Involvement of stakeholders in development
Wider applicability	Potential for expansion to EU as a whole. Potential international standard.

This second stage analysis was conducted by product type and also for cross-cutting documents that referred to several product types. The analysis distinguished between documents intended for professional and industrial users and those for consumers and the broader public. The results of this analysis are presented in Appendix I and summarised in Section 3.6 below.

In the third stage, a series of in-depth interviews were carried out with selected government bodies, industry associations and other organisations that have prepared potential best practice documents.

The interviews explored the processes by which these documents are developed and also asked for information on their implementation as well as broader questions on the relationship between best practice documents and the regulatory structure.

1.3 Structure of the final report

The following section reviews the policy context for this study. Due to the lack of existing definitions on 'best practice' and 'sustainable use of biocidal products', Section 2 moreover discusses these key terms.

Section 3 then provides an overview of the guidance documents that have been identified. The guidance documents are presented from different angles, such as the type of the organisation that developed the best practice, whether they are aimed at professional or consumer use, the product type etc. More specifically, Section 4 provides an analysis of approaches for best practice guidelines for sustainable use. The potential best practices are analysed on the basis of the main stages of their implementation (development; dissemination; and monitoring/evaluation).

Section 5 explores the potential for best practice at the EU level. First, it provides some initial ideas on how best practices can be used at the EU level, by analysing the experience of using 'best practice' in other areas. Following, it sets out a number of options that the Commission could consider for promoting best practices for sustainable use of biocides throughout the Member States. In conjunction, Section 6 provides an initial assessment of the costs and benefits to principle stakeholders of the options identified in Section 5.

Finally, findings and conclusions on the existing best practices on sustainable use of biocidal products and their potential use at the EU-wide level can be found in Section 7.

2 Defining best practice for the sustainable use of biocidal products

2.1 Policy context for the study

Directive 98/8/EC concerning the placing of biocidal products on the market is currently undergoing a review. The proposal for a new Regulation on biocidal products[10] aims to strengthen protection of human health and the environment and to establish more harmonised rules in relation to the approval of active substances and the placing on the market and use of biocidal products.

The Sixth Environmental Action Programme called for the development of a thematic strategy with the objective of minimising risk to human health and environmental degradation from pesticide use. In view of this, in 2006 the Commission put forward *A Thematic Strategy on the Sustainable Use of Pesticides.*[11] This was accompanied by a proposal for a Framework Directive on the sustainable use of pesticides,[12] which was adopted as Directive 2009/128/EC establishing a framework for Community action to achieve the sustainable use of pesticides (Sustainable Use Directive).

The Sustainable Use Directive defines "pesticide" as (a) a plant protection product as defined in Regulation (EC) No 1107/2009 and (b) a biocidal product as defined in Directive 98/8/EC.[13] However, the scope of the Sustainable Use Directive, as set forth in its Article 2, makes it clear that the Directive applies only to plant protection products.

The Sustainable Use Directive was adopted in parallel with Regulation (EC) No 1107/2009 concerning the placing of plant protection products on the market (PPP Regulation). This was to ensure that the widely recognised gap under the previous EU legislation on plant protection products concerning the "use" phase could be addressed. The new PPP Regulation's rules concerning the authorisation process is complemented by the Sustainable Use Directive's provisions regulating the use phase of plant protection products.

Directive 98/8/EC similarly focuses on the authorisation of biocidal products and does not regulate the use phase. While the proposed Biocidal Products Regulation includes a few provisions addressing the use phase, it does not regulate the use phase systematically.

Whereas neither the Sustainable Use Directive nor the PPP Regulation define "use", a definition of "use" is provided in the proposed Biocides Regulation, as follows:

> *all operations carried out with a biocidal product, including storage, handling, mixing and application, except any such operation carried out with view to export of the biocidal product outside the Community.*[14]

This definition of "use" focuses on the product and the steps leading up to its application. This is in accordance with the aim of the proposed Regulation, which is to address the risk (acceptable/non-acceptable) for a biocidal substance, based on the product (properties and toxicity) and its application (exposure). Both Directive 98/8/EC and the proposed Regulation thus place the major obligation on the person placing the biocidal product on the market, and not on the actual user.

[10] COM (2009) 276.
[11] COM(2006) 372 final.
[12] COM(2006) 373 final.
[13] Article 3(10) of Directive 2009/128/EC.
[14] COM(2009) 267 final, Article 3(j).

There is an ongoing debate about the best ways to address the use phase of biocides including the various regulatory options. A 2008 study (*Assessing the Impact of the Revision of Directive 98/8/EC concerning the Placing of Biocidal Products on the Market*) considered three options to address the use phase of biocides:[15]

- Biocides could be included in a future revision of the Directive on Sustainable Use of Pesticides
- Directive 98/8/EC could include provisions on the use phase of biocides
- An independent framework on the use phase of biocides could be created.

It should be noted that the Biocidal Products Directive provides for a 10-year transitional period to allow the completion of a review of the active substances used in biocidal products that were already on the market when the Directive came into force on 14 May 2000. The transitional period was later extended from 14 May 2010 to 14 May 2013 (amendment of Article 16 of the Directive). This review is still under way and therefore some have argued that it is premature to consider whether additional measures focusing on the use phase are needed in order to foster sustainable use.

However, as noted above, the Biocidal Products Directive is product-centered and aimed at determining levels of acceptable risk; it has no direct link to the concept of sustainable use of biocidal products.

In the meantime, the Commission is interested in exploring alternative ways to support actions at EU and/or Member State level to encourage sustainable use of biocidal products. Among the options being considered by the Commission is the role that best practices could play in the future policy on the sustainable use of biocidal products.

The current study aims to contribute to the process of identification of best practice for the sustainable use of the 23 biocidal product types, by cataloguing and analysing existing guidance and other materials by product type. In this context, it is important to define what constitutes best practice for sustainable use of biocides.

2.2 Defining best practices for the sustainable use of biocidal products

The process of information gathering in the course of this study did not identify any definitions of best practice with regards to sustainable use of biocidal products. We discuss each of the key terms separately below.

- **"Sustainable use"**

The concept of 'sustainability' is seldom defined in legislative text. It is linked to the concept of 'sustainable development' and its three pillars: social/human, economic, and environmental. The pillars are considered of equal importance, and a balance between them is required to achieve sustainability. This inevitably implies certain trade-offs as well as potentially win-win situations.

For example, in the context of biocides, a decision to control a pest or other harmful organism may value economic (cost-effective) or social (labour-saving) aspects more highly than environmental aspects and not take the potential environmental long-term impacts of a biocidal product use sufficiently into account. On the other hand, awareness of the problem of microbial resistance to biocides might contribute to a reduced use of disinfectants, which could lead to cost savings (economic pillar), retention of the efficacy of disinfectants (social pillar) and lower impact on aquatic species (environmental pillar). Existing biocidal use may cover

[15] 2008 RPA, Hydrotox and Milieu *Study on Assessing the Impact of the Revision of Directive 98/8/EC concerning the Placing of Biocidal Products on the Market*, p. 172.

part of these aspects: for example, social aspects such as the protection of human health,[16] e.g. through the use of disinfectants or other agents for controlling harmful organisms; economic aspects, such as the use of preservatives for materials or processes; and environmental aspects such as the control of alien species though antifoulants.

Sustainable use is thus a fairly broad concept. The definition of "use" discussed in the previous section focuses on operations related to the use of a particular product and on how to reduce risks to health and the environment due to those operations. In the context of biocidal products, however, the concept of "sustainable use" considers the use of biocides in general, along with the overall risks posed by all biocidal product use, and aims at the overall least impact on human health and the environment while maintaining the necessary level of control of pests and other harmful organisms.

Sustainable use thus keeps in mind the objective of preventing or controlling the growth of harmful organisms or of materials preservation, etc., while highlighting the importance of considering the three pillars of sustainability at the various points when decisions are made concerning how to achieve the desired objective. Important decision points include consideration of long-term measures aimed at prevention, use of thresholds in combination with monitoring of harmful organisms to determine when an intervention is needed, and the choice of which control option to apply. This emphasis on decision points is also followed in the application of integrated pest management (IPM), as applied in plant protection, and is discussed in more detail in the next section.

The definition of 'proper use' found in Article 3(7) of the Biocides Directive and Article 15(5) of the proposed Biocidal Products Regulation partly addresses this element of decision-making:

> *Proper use shall include compliance with the conditions for granting an authorisation…and labelling requirements…Proper use shall also involve the rational application of a combination of physical, biological, chemical or other measures as appropriate, whereby the use of biocidal products is limited to the minimum necessary.*[17]

The term 'proper use' is still product-centered in that it refers to the requirements for Annex I inclusion of the active substance for that product type, in combination with the requirements for receiving authorisation for placing a particular biocidal product with that active substance on the market, including the conditions stated on the product label. However, it also includes elements of sustainable use. It notes that 'proper use' is to include such decision points as combining various methods to control harmful organisms, limiting use of biocides, and taking account of local conditions.

"Sustainable use of biocidal products" thus focuses on the various points at which the operator makes decisions aimed at achieving the objective of controlling harmful organisms including pests, and considers all three pillars at each point.

The following example illustrates why a definition of use that focuses on the application of the product is insufficient for considerations of sustainability. For biocides used for preservation of materials (PT 6-10) and antifouling agents (PT 21), a considerable part of total emission takes place during the service life, through leaching or the removal of coatings of treated articles. While the service life of a biocidal product is taken into consideration during the product authorisation process, and the product is authorised only for specific uses in terms of its service life, the operator taking the decision concerning which control method to use may not have full cognisance of the duration of the emissions that will occur during the service life. There may be

[16] Consideration of protection of human health as one of the social aspects of sustainability follows the lead of Agenda 21, which includes "Protecting and promoting human health conditions" in the section on Social and economic dimensions, and not in the environment section (Conservation and management of resources for development).

[17] Note also that Article 20(2) of the proposed Regulation includes, as one of the elements in the authorisation summary, information on the "qualitative and quantitative composition in terms of the active substances and non-active substances, knowledge of which is essential for proper use of the biocidal product."

other, more "sustainable" control options available, including preventative measures or alternative, non-chemical options. In weighing those options, the issue of service life (an economic factor) should be carefully weighed against the long-term impact on the environment. It is at decision points such as these that a balanced approach considering all three pillars is needed in order to ensure sustainable use of biocidal products.

In summary, it is recognised that the current Biocidal Products Directive and the proposed Regulation have detailed procedures for the review of active substances and then biocidal products, and for determining any conditions for marketing and restrictions on use to mitigate risks from such use. The Directive nonetheless focuses on the placing on the market of biocidal products. Moreover, the review procedures address of necessity a specific set of risks following criteria agreed at the EU level.

Sustainable use is however a more comprehensive policy that includes all risks from biocides: it goes beyond acceptable risk to seek further risk reduction that can be achieved while ensuring effective action against harmful organisms. This provides a further margin for ensuring minimal impacts on health and the environment from the product's application. It can also reduce costs, thus addressing the economic pillar of sustainable use.

- **"Best practice"**

The term 'best practice' as well as the term 'good practice' is used in the Sustainable Use of Pesticides Directive: Article 15.2(c) on identification of risk indicators refers to 'good practices', while Article 18 on 'exchange of information and best practice' and Article 22 on expenditure both refer to 'best practices'. Neither term is defined or used in the Biocides Directive or the proposed Biocides Regulation.

However, the term "good plant protection practice" is found in Article 3(18) of the PPP Regulation:[18]

> *a practice whereby the treatments with plant protection products applied to given plants or plant products, in conformity with the conditions of their authorised uses, are selected, dosed and timed to ensure acceptable efficacy with the minimum quantity necessary, taking due account of local conditions and of the possibilities for cultural and biological control.*

Note that the use of this term 'good plant protection practice' (GPPP) has strong similarities to the term 'proper use' as it appears in both the Biocides Directive and the proposed Biocides Regulation: the use of the pesticide product in accordance with all EU rules in place, including the conditions stated on the product label, and limited to "the minimum quantity necessary". The definition recognises the decision points of selection, dosage and timing as important elements of GPPP. Factors such as selection (type of pest, mode of action), dosage (efficacy, unacceptable effects) and timing (i.e. winter, summer, number of applications) are considered during the risk assessment process carried out in evaluating the active substance for inclusion in Annex II and the process of deciding whether to authorise a particular product. These elements are taken into account to arrive at conditions of authorisation that have been determined to present an acceptable level of risks.

This process of risk assessment and authorisation is still product-centered. In considering what is an acceptable level of risk in the application of a product, it may miss opportunities for further reductions of risk which might be possible at other critical decision points, such as initial long-term prevention measures or alternative non-chemical control options.

At the beginning of this study, the research team developed a working definition of 'good practice' in the context of biocides, which it used on the questionnaires sent out to Member States and industry, in order to

[18] Other possible references include the IPPC Directive's use of 'best available techniques', the Water Framework Directive's use of 'best environmental practices' and the Nitrates Directive' use of 'codes of good agricultural practice'.

support the identification of best practice guidance documents. The working definition combined the PPP Regulation's definition of "good plant protection practice" with the Biocides Direction concerning proper use, as follows:

> **'*Good biocide use practice'*** *means a practice whereby the application of biocides to control organisms, in conformity with the conditions of their authorised uses, are selected, dosed and timed to ensure acceptable efficacy with the minimum quantity necessary, taking account of local conditions and a combination of physical, biological, chemical or other measures as appropriate.*[19]

In retrospect, this working definition also focused on the use of the product, rather than considering the opportunities for further reduction of risk at various decision points and for a more balanced consideration of the three pillars (economic, social, environment) that are necessary for a *sustainable* use of biocides.

Additionally, on the questionnaire, the research team tried to differentiate between 'good practice' and 'best practice':

> ***'best practice'*** *is distinguished from good practice through the development and elaboration of further voluntary or mandatory measures on the sustainable use of biocidal products, in particular to reduce risks to human health and the environment.*

The term "further" referred to measures that go beyond existing regulatory obligations. The next section builds on this working definition. It considers how to achieve the objective of controlling harmful organisms in such a way as to have the least impact on human health and the environment, by applying due consideration of the three pillars of sustainability at key decision points.

2.3 Further considerations for identifying best practices for sustainable use of biocides

On the basis of the preceding discussion, it is possible to begin to develop several criteria for best practices. The criterion of going beyond regulatory requirements has already been noted. The 2006 Thematic Strategy on Sustainable Use of Pesticides provides an additional basis with its statement that it is "necessary to reduce the risks from pesticides to humans and the environment as far as possible by minimising or eliminating, where possible, exposure and by encouraging the research and development of less harmful, including non-chemical, alternatives." Thus at least three criteria for best practice can be identified:

- Going beyond existing EU regulatory standards
- Consideration of all three pillars of sustainability
- Minimising and/or eliminating exposure, including use of less harmful, including non-chemical, alternatives

The Sustainable Use Directive also provides an important reference for this topic, though it applies mainly to plant protection products. This Directive is nonetheless important in terms of considering how to define sustainable use of biocides; key elements are described further in the box below.

[19] Article 3 of the PPP Regulation, in conjunction with Article 3(7) of the Biocides Directive.

The Sustainable Use Directive

The Sustainable Use Directive requires Member States to develop National Action Plans (NAPs) to set objectives, targets, measures and timetables to reduce risks and impacts of pesticide use on human health and the environment. While it currently focuses on plant protection products, the possibility is kept open for including biocides within NAPs.

The Directive requires all professional users, distributors and advisers to have access to appropriate training. Certification systems providing evidence of attendance to training must be established. Distributors selling pesticides classified as toxic or very toxic need at least one person in their employment to have a certificate and to be available at the point of sale to provide information to customers. Certified distributors must provide adequate information to customers with regard to pesticide use, health and environmental risks and safety instructions.

Member States must inform the general public, promote information and awareness-raising programmes, and make accurate and balanced information available relating to pesticides for the general public - in particular regarding the risks and the potential acute and chronic effects for human health, non-target organisms and the environment.

Moreover, Member States must promote low pesticide-input farming and ensure that professional users of pesticides shift towards a more environmentally-friendly use of all available crop protection measures. This is to include establishment (or support) of all necessary conditions for the implementation of integrated pest management. Farmers are to have access to systems for pest monitoring and decision-making, as well as advisory services on integrated pest management. Member States should also establish appropriate incentives to encourage professional users to implement crop- or sector-specific guidelines for integrated pest management on a voluntary basis.

Finally, Member States must adopt the necessary measures to ensure that the handling of pesticides will not endanger the health or safety of humans and the environment. This includes all activities before and after the application of pesticides, handling of packaging and remnants after application, and cleaning of the equipment. Additional measures include requirements aimed at protecting the aquatic environment and drinking water and provisions stating that the use of pesticides in areas used by the general public or in protected sites such as Natura 2000 shall be prohibited or restricted to the minimum necessary.

The following sections discuss the three main criteria identified above.

- **Going beyond existing EU regulatory standards**

The criterion of going beyond existing legislative requirements is particularly important in the context of biocidal products, given the broad range of application (as is evident from the 23 different product types), the different types of settings for their use (from households to hospitals to wood preserving plants) and, consequently, the range of options for reducing the use of biocides (and therefore their impacts) by non-chemical prevention and control methods i.e., best practices. With this diverse range of applications, use and options of reduction of use, it is unlikely that the existing regulatory requirements cover all options. From that perspective, the use of best practices is considered particularly useful: they can elaborate the PT specific options that are not regulated.

Indeed, because of the many PTs and the range of their applications, the opportunities for reducing the use of biocidal products by non-biocide prevention and control methods have a correspondingly wide range.

- **Consideration of all three pillars of sustainability**

Another key criterion, in our opinion, is that a best practice should consider all three pillars of sustainable development. In addition to such economic considerations as efficiency of application, the pillars of human health and the environment should also be given due weight.

As previously noted, the Biocidal Products Directive's procedures for assessing risks to health and the environment and then determining conditions for marketing and use to keep such risks at acceptable levels, following criteria agreed at EU level. However, in considering a number of the documents put forward for consideration as best practices by some Member States and industry, a lack of attention to the pillar of environment was often noted. For example, several detailed guidelines on safe application methods, e.g., during fumigation and other professional situations, were aimed primarily at protecting the health of the professional user. While health and safety at work is a very important social objective, it is equally important to consider reduction of risk to the environment by reducing environmental exposure. Moreover, reduction of environmental exposure by, e.g., better calibration of application equipment to reduce amounts used, may also result in lower costs and thus lead to a better economic outcome as well.

Note that the Sustainable Use Directive requires Member States to ensure that the use of pesticides is minimised or prohibited in certain specific areas, including areas used by the general public or vulnerable groups, and protected areas within the meaning of the Water Framework Directive and the Wild Birds and Habitats Directives. However, the provision (Article 12) refers to plant protection measures, and therefore best practices in the context of biocides also need to pay special attention to the need to reduce exposure of vulnerable groups and protected sites.

- **Reducing risks from biocides by minimising and/or eliminating use of biocides, including by ensuring priority given to less harmful, including non-chemical, alternatives**

While the Sustainable Use Directive does not specifically cover biocidal products some of the measures it has set in place could well be considered with respect to the sustainable use of biocides. Examples are training and certification of operators, requirements for points of sale, consideration of integrated management measures for the control of harmful organisms, consideration of the application equipment which could be adopted also with respect to biocidal products.

It is important to note in particular the Sustainable Use Directive's requirement for Member States to promote low pesticide-input pest management, *inter alia* by giving priority to non-chemical methods and by ensuring that professional users have at their disposal information and tools for pest monitoring and decision-making, as well as advisory services on integrated pest management (IPM). Article 3(6) of the Sustainable Use Directive defines "Integrated Pest Management" as:

> *careful consideration of all available plant protection methods and subsequent integration of appropriate measures that discourage the development of populations of harmful organisms and keep the use of plant protection products and other forms of intervention to levels that are economically and ecologically justified and reduce or minimise risks to human health and the environment.*

This definition of IPM recognises the importance of the various decision points related to pest control which are important for achieving "sustainable use". It refers to the need for "careful consideration of all available methods" as well as "other forms of intervention", and therefore is not as product-centred as the definition of "proper use". Moreover, it has elements of all three pillars of sustainable development ("economically and ecologically justified"; "human health and the environment").

In an annex, the Sustainable Use Directive lists eight general principles of IPM. The principles are largely drawn from agricultural IPM, which is in line with the Sustainable Use Directive's focus on plant protection

products. Indeed, the Directive tasks Member States with promotion of low pesticide-input *farming* and the creation of conditions necessary for implementation of Integrated Pest Management (IPM) by *farmers*.[20]

General principles of Integrated Pest Management
(Annex III to Directive 2009/128/EC)

1. Measures for the prevention and/or suppression of harmful organisms
2. Adequate methods and tools for monitoring of harmful organisms
3. Definition of threshold values as basis for decision-making
4. Preference of non-chemical methods
5. Target-specificity and minimisation of impact on non-target organisms, health and the environment
6. Reduction to use of minimum necessary level
7. Application of strategies on anti-resistance
8. Check of success on the basis of records, monitoring and documentation

However, IPM is equally relevant for considering the issue of "best practices for sustainable use of biocides." The study's review of some of the cross-cutting guidance documents gathered for this project identified a number of steps aimed at minimising use of pesticides for control of non-agricultural pests.

In this context the HACCP-concept (Hazard Analysis and Critical Control Points) for food and feed hygiene used in the food industry to identify potential food safety hazards and address them by integrated measures reducing or eliminating the risks is another example for a management concept considering best practice. Within industry, the term "good housekeeping" is often used, while aiming to eliminate inefficiencies and accident hazards caused by unfavourable conditions at the workplace.[21]

It is relevant to acknowledge here that it is not a straight forward task to apply IPM across the range of non-agricultural pests. The biocidal products regulated by the Biocides Directive have been categorised into 23 different product types covering a broad range of application and different types of settings for their use. The range of options for reducing the use of biocides (and therefore their impacts) by non-chemical prevention and control methods are similarly much wider than for plant protection products.

Nonetheless, if considered as separate decision-points (or steps), and if the pillars of sustainable development are given a balanced consideration at each step, the general principles of IPM can provide the guidance needed to define best practices for sustainable use of biocides. Note that a similar conclusion was reached by the 2008 study carried out by COWI.[22]

[20] Within the context of Directive 2009/128/EC a guidance document for establishing IPM principles has been elaborated where general and crop specific IPM principles are distinguished. European Commission. 2009a. Development of guidance for establishing Integrated Pest Management (IPM) principles. Final Report 07.0307/2008/504015/ETU/B3 by BiPRO Beratungsgesellschaft für integrierte Problemlösungen, http://ec.europa.eu/environment/ppps/pdf/final_report_ipm.pdf. European Commission. 2009b. Draft Guidance Document for establishing IPM principles Supplement to the Final Report 07.0307/2008/504015/ETU/B3, http://ec.europa.eu/environment/ppps/pdf/draft_guidance_doc.pdf.

[21] See http://www.osh.dol.govt.nz/order/catalogue/archive/goodhousekeeping.pdf and http://www.hse.gov.uk/pubns/iacl103.pdf.

[22] 2008 RPA, Hydrotox and Milieu, *Study on Assessing the Impact of the Revision of Directive 98/8/EC concerning the Placing of Biocidal Products on the Market*, p. 15-16.

2.4 Policies and approaches that support sustainable use

The considerations discussed above are in relation to decisions on control of harmful organisms in general. To summarise, best practice means going beyond the regulatory requirements, which are largely product-centred. It emphasises the points where pest control-related decisions are made. It involves consideration of economic, social *and* environmental aspects at those various points. It gives priority to non-chemical pest control methods first, and turns to biocidal products only when alternative approaches or techniques are insufficient to keep pests below the thresholds where economic damage occurs.

In the context of biocides, these types of decisions on integrated control of harmful organisms are made by a wide range of people – consumers, professional applicators, industrial process engineers, health care workers. For the EU and its Member States, it is important to keep in mind the many types of supporting policies and approaches that governments and industry can set in place to promote and encourage the application of best practices. These include (but are not limited to):

- Making information on best practices on sustainable use of biocides – and their alternatives – widely available (through websites, labelling, guidance documents)
- Actively disseminating that information through public awareness campaigns
- Monitoring practices with respect to biocide use and their impacts on health and the environment, in order to identify when interventions are needed and to track progress in addressing those problems
- Keeping records and statistics of products used, in support of the monitoring above
- Including biocidal products in the National Action Plans (NAP) being developed under the Sustainable Use Directive
- Funding support for research and development to support IPM with respect to specific PTs
- Training and certification for best practices with respect to specific PTs
- And, underwriting all of the above, including effective legislative frameworks and regulatory guidance

The next sections of this report include information on a number of supporting policies and approaches like the above that have been set in place by governments or other stakeholders.

3 Overview of the guidance documents identified in the information gathering process

This section presents an overview of the documents identified in the literature review and the first two stages of consultation. It also makes an initial analysis of potential gaps, again by product type. Finally, the section provides a detailed overview of documents by product type. This section provides a broad picture; Section 4, which follows, makes an in-depth review of a selected set of documents.

3.1 Overview of all possibly relevant documents identified

The possible guidance documents that were identified in the literature review and through the first two stages of consultation with Member States and stakeholders (described in the previous section) were all listed in a large, multi-category matrix (see the box below). This matrix is provided as a separate deliverable in the form of an Excel sheet.

The matrix of possible best practice documents

The categories included the title, source and Internet address, as well as:

- Product types covered (including whether a guidance covered all or many PTs); and
- Specific users targeted (in particular, professionals or consumers).

This categorisation allowed an initial determination whether a document

- May represent best practice;
- Represents a national or international technical standard.

Further analysis covered the following topics:

- Author and country of origin;
- Intended audience (professionals, consumers or other users);
- Scope (use phase or wider);
- Initial information on the goals of the guidance;
- Whether stakeholders have or were likely to have been involved in the development of the guidance; and
- An initial judgement whether the guidance has the potential to be applied across the EU as a whole.

In total, the information gathering identified 471 documents that are possibly relevant to the study (see Table 3.1).

Many documents cover more than one PT. For this reason, the total number of documents prepared by each type of organisation (listed at the top of the table) is lower than the sum of the documents for each PT. Some of the documents cover a smaller number of PTs, often within one main group (e.g. many documents cover more than PT under main group 3, pest control). Other documents cover more than one main group and several PTs. The "cross-cutting" documents identified in Table 3.1 are those that meet two criteria: (1) guidance that covers more than five PTs (2) across at least two main groups.

Table 3.1 All documents identified through the information gathering

Prod. Type	MS	EU bodies	Inter-national Orgs.	Gov. / non-EU countries	Ind. Assns	Prof. Assns	Corp.	Stan-dards Orgs.	NGOs	Other
Total	**166**	**10**	**27**	**40**	**79**	**48**	**21**	**46**	**9**	**25**
1	27		3	1	17	6		3		1
2	64		4	18	23	17	9	12	1	5
3	12				5	2				
4	20	3	3	7	12	3	1	2		2
5	7		1		4			4		1
6	5				6					
7	6				4					
8	20		2	8	15	10	6	14		4
9	5	2	1							
10	7		1		5					2
11	7	1			3			2		4
12	4	1			4			2		
13	19		1		10					2
14	35	1	2	13	12	12	4	1	3	6
15	7		2	3	5	3			2	2
16	8				5					2
17	6		2		5				1	2
18	23		7	19	16	9	5	6	3	8
19	12		1	13	9	3			1	3
20	4									
21	15	1	1	1	2				5	
22	6					1				
23	11			8		2			1	2
Cross-cutting	11	9		7	7	3			1	1

Notes: based on the matrix in Excel developed for the project. Many documents cover more than one PT: thus, the totals for most columns are higher than the sum of documents. See the text for the definition of cross-cutting documents.

Member State governments prepared the highest number of documents, over one-third of the total. This category includes competent authorities, other national government bodies as well as (in a few cases) local and regional governments.

The second highest number of documents was prepared by industry associations in the EU. Fewer documents were prepared by professional associations in the EU, non-EU governments and standards organisations (the latter group includes standards organisations in the EU as well as ISO). The "other" category includes articles and books relevant to biocides, as well as documents produced by academic institutions.

While government bodies in Member States represent the largest category, it should be noted that documents were identified for government bodies in only 11 of the 27 Member States:

- Austria (1 document)
- Belgium (11 documents)
- Germany (53)

- Estonia (1)
- Finland (2)
- France (1)
- Ireland (2)
- Italy (2)
- Malta (1)
- Netherlands (1)
- UK (91)

While the information gathering may have missed some documents prepared by government bodies, including in the Member States not listed above, all competent authorities were contacted over the course of the study and all but eight replied to at least one stage of the information gathering.

It is also clear that the overwhelming majority of documents by Member State governments – over 85% – were identified in only two countries, Germany and the UK. This suggests that guidance and best practice documents may have a special role in these two countries. This issue was explored in the interviews and is reviewed further in Section 4.

3.2 Overview of potential best practice documents

A screening analysis then identified those documents that appeared to present best practice for the use of biocides. This review was carried out by product type: it is detailed in Appendix I, and Section 3.4 below provides a summary of the results for individual PTs. This followed the criteria described in Section 1.2.2 (for details, see Appendix I). An overview of results is presented in the table below. Column 1 shows the number of all documents identified per product type (i.e. it is the sum of each row in Table 3.1), while column 2 shows the number that were identified as potential best practice documents.

Most of the potential best practice documents (column 2) are destined for industry and professional users (column 3). Many of these represent standards for use in industry (column 4).

For most PTs, fewer potential best practice documents are oriented towards the public and consumers (column 5) than towards industry and professional users. Many of the documents identified for the public and consumers also refer to industry and professional users and thus are counted in both columns 3 and 5.

The categories with a high number of potential best practice documents are in bold: these are PT1, PT2, PT8 and PT14. In addition, these four product types have a high number of documents for industry and professional users. The product types where a relatively high number of potential best practice documents were identified for the public and consumers are PT3, PT8, PT14 and cross-cutting product types.

3.3 Identifying possible gaps

Review of the product types

The review of potential best practice documents has thus indicated product types for which a high number of documents have been prepared, and those with a relatively low number. In an analysis of possible gaps, it is also useful to compare the number of best practice documents with the level of risk for each product type.

Table 3.2 Potential best practice documents

PT	1. All documents identified	2. Potential best practice documents	3. Documents for industry/ prof. users	4. Of which, standards	5. Documents for public/ consumers
1	58	**36**	**36**	4	4
2	153	**59**	**55**	**32**	9
3	19	16	16		**16**
4	53	20	20	9	3
5	17	4	4	2	3
6	11				
7	10				
8	79	**37**	**37**	**22**	**16**
9	8	1	1	1	
10	15	1	1		
11	17	9	9	4	
12	11	1	1	1	
13	32	11	11	6	
14	89	**41**	**32**	3	**14**
15	24	2	2		
16	15	n.a.	n.a.	n.a.	n.a.
17	16	2	2		
18	96	20	18	10	3
19	42	11	9		8
20	4	n.a.	n.a.	n.a.	n.a.
21	25	14	13	3	7
22	7	2	2		
23	24	6	6		
Cross-cutting	30	17	14		**10**

Notes:
n.a. = not assigned (this is the case for PT16, where no active substances have been submitted for the review programmes, and PT20, which would be removed under the proposed Regulation to replace the Biocidal Products Directive).
Categories with a high number of documents are in **bold** – specifically, those with 30 or more potential best practice documents; 30 or more documents for industry or professional users; 20 or more standards; 10 or more documents for public/consumers.

A previous study by COWI[23] developed estimates of the relative risks of the use phase of biocides. This study gathered information on the amounts used, the human exposure and the environmental exposure for each product. The study noted that no quantitative data are available for many of these categories. As a result, estimates were made based on available information. The resulting scores are presented in qualitative terms: minor, moderate, significant or major/high.

[23] COWI, *Assessment of different options to address risks from the use phase of biocides*: Final report, March 2009, Table 1.

Table 3.3 Comparison between the number of potential best practice documents and the COWI coefficient of risks for the use phase

Product type	1. COWI overall assessment of risk (see Key)	2. Number of Potential best practice documents	2. Product types often used by public/ consumers	3. Potential best practice guidance available for public/consumers
1	X	36	✓	✓
2	XX	59	✓	✓
3	X	16		
4	X/XX	20		
5	X	4		
6	X			
7	X/XX		✓*	
8	XX/XXX	37	✓	✓
9	X	1		
10	XX	1	✓	
11	XX	9		
12	X/XX	1		
13	X	11		
14	XX	41	✓	✓
15	-/X	2		
16	-/X	n.a.		
17	-/X	2		
18	XX/XXX	20	✓	✓
19	-/X	11	✓	
20	-/X	n.a.		
21	XX	14	✓**	✓
22	-	2		
23	-/X	6	✓	

Note:
✓* - While consumers do not use PT7 biocides directly, they may use products that contain them (e.g. anti-mould paints) and thus be exposed in both application and the service life of these products.
✓** - PT21 is used only among a restricted group of public and consumers (boat owners and users).
Key to the COWI assessment:

XXX = major/high risk
XX = significant risk
X = moderate risk
- = minor/low risk

Source for Column 1: COWI, Assessment of different options to address risks from the use phase of biocides: Final report, March 2009, Table 1.

Table 3.3 above presents these scores – here called the "COWI risk coefficient" – for each product type, together with the number of potential best practice documents. The table also indicates those product types often used by the public and consumers (as per the COWI study) and those for which potential best practice guidance is available for the public and consumers (as per Table 3.2).

The table shows that for the majority of PTs assessed by COWI as having greater than moderate risk, there is best practice guidance available, including guidance available for consumers where this is relevant. Four PTs assessed as having greater than moderate risk, though, have only limited guidance available. There is no

guidance for PT7, film preservatives, which is assessed as posing modertate to significant risks. There are only a limited number of best practice guidance documents for PTs 10, 11 and 12 (masonry preservatives, preservatives for liquid cooling and processing systems and slimicides). There is no best practice guidance for consumers on PT10, even though this PT is often used by consumers. Gaps thus appear to exist for these four PTs.

Microbial resistance

While 39 potential best practice documents cover cross-cutting issues, none of these focus on the issue of microbial resistance, a key cross-cutting issue, though it is addressed in several documents for PT2 (see section 3.4 and Appendix I).

Three aspects need to be considered regarding microbial resistance:

- In the study on the impact of the revision of the BPD, concern has been raised that any reduction of the variety of biocidal active substances and biocidal products available on the market could make it more difficult to combat resistance;[24]
- Avoidance of resistance to active ingredients can be addressed by resistance management strategies (change of the active substance used, combination products with more than one active substance, integrated pest management);
- Misuse of biocides could induce resistance of the active substance to target organisms. The Scientific Committee on Emerging and Newly Identified Health Risks recently discussed the potential impact of biocide use on antibiotic resistance. The study concluded that some resistance mechanisms are common to both biocides and antibiotics (SCENIHR, 2009).[25]

It is underlined that no quantitative data on benefits of resistance control by biocides or the impact of misuse of biocides on resistance development are available.

3.4 Review of the documents by product type

The following sub-sections summarise the findings of the review by product type. Overview tables are provided for each PT. The total includes all documents identified for the product type, including those that cover more than one PT.

Potential best practice documents were identified based on the criteria presented in Section 1.2.3. This number can include documents that cover more than one PT, if they provide useful best practice for the PT in question.

Of these potential best practice documents, the tables then indicate how many are intended for industry or professional users, how many of these are standards, and the number of documents for consumers and the public. (Some documents are directed at both industry/professionals and consumers/public and thus are counted in both columns.)

The text for each section provides a summary review of the potential best practice documents. These summaries are based on the longer analysis set out in Appendix I.)

[24] See RPA *et al, Assessing the Impact of the Revision of Directive 98/8/EC concerning the Placing of Biocidal Products on the Market* (study for the European Commission), August 2008.
[25] SCENIHR. 2009. *Assessment of the Antibiotic Resistance Effects of Biocides. Scientific Committee on Emerging and Newly Identified Health Risks*, 19 January 2009 .
See http://ec.europa.eu/health/ph_risk/committees/04_scenihr/docs/scenihr_o_021.pdf.

- **Product Type 1: Human Hygiene Biocidal Products**

Total no. of documents identified for the PT	Potential best practice documents	Documents for industry/ professionals	Of which, standards	Documents for consumers/public
58	36	36	4	4

The study identified 58 items of guidance that are potentially relevant to the use of PT1 (many of these touch on other product types: 51 also provide guidance on the use of PT2, 23 on the use of PT4 and six on the use of PT3).

Of the 58 documents for PT1, 36 have been identified as potential best practice documents.

Guidance was produced by industry associations, including the International Association for Soaps, Detergents and Maintenance Products (AISE), the European Chemical Industry Council (Cefic) and EuroChlor. Some industry association guidance is designed for use by product manufacturers and via them to professional and/or consumer users. Some of this guidance is available online in an accessible form suitable for professional or consumer users. The second source of guidance on the use of PT1 is national and international organisations concerned with occupational hygiene. This guidance often focuses on specific occupations or occupational settings and also covers PT2 and PT4 biocides.

No guidance was identified that is designed solely for use by consumers. However, the consultation process identified four guidance documents on labelling of PT1 products that are easy to access, and classified these as suitable for consumers along with industrial and professional users.

The majority of the potential best practice documents were produced with at least some stakeholder involvement. All of the guidance identified appears to be readily adaptable for use across the EU.

- **Product Type 2: Private area and public health area biocidal products**

Total no. of documents identified for the PT	Potential best practice documents	Documents for industry/ professionals	Of which, standards	Documents for consumers/public
153	59	55	32	9

There is a very large number of documents on general hygiene management, which mainly address the decision on "when to apply" disinfectants but do not provide specific guidance on "how to apply". For this reason, 59 documents were considered potential best practice documents out of the 153 identified.

The review noted a discussion underway in Germany about the benefit and usefulness of surface disinfectants in private homes: one position holds that biocides should not be used by consumers except in specific cases (e.g. a doctor's orders), to avoid the risk of enhancing microbial resistance. These researchers argue that untrained consumer use of disinfectants is often ineffective against microbes.[26]

In the public or medical sector, including disinfectants for medical equipment, many documents from professional organisations and authorities provide a good basis for future harmonisation. In Germany, occupational health organisations also provide practical background information on how to select and apply

[26] See for example: Bundesinstitut für Risikobewertung (BfR), Verbrauchertipps zu Lebensmittelhygiene, Reinigung und Desinfektion (2005) .

disinfectants. For swimming water treatment, there are also technical standards and guidance on health and safety management, which could serve as a basis for best practice.

Few useful documents are available for disinfectants for laundries, air conditioning systems, chemical toilets, wastewater and hospital waste. National and European technical standards exist for the construction, design and operation of laundries and air conditioning systems. However, the extent to which biocides are addressed in these remains unclear.

- **Product Type 3: Veterinary Hygiene Biocidal Products**

Total no. of documents identified for the PT	Potential best practice documents	Documents for industry/ professionals	Of which, standards	Documents for consumers/public
19	16	16	0	16

The consultation process has identified 19 items of guidance with possible relevance to the use of PT3 (many of these are relevant for other categories of disinfectants: 14 documents also provide guidance on the use of PT2, 8 on the use of PT1 and 14 on the use of PT4).

Of the 19 items identified, 16 were considered potential best practice documents for PT3.[27]

The majority of the documents are focused primarily on the prevention or control of animal diseases. Although this falls outside of PT3, these documents were included as they involve aspects of veterinary hygiene.

All of the guidance identified was designed for use by livestock keepers, with the impression given that these could be professional or semi-professional. However, it is also available for consumers (non-commercial livestock keepers, e.g. those who keep horses for their personal use). The guidance has been produced by product manufacturers, providing guidance on the most appropriate use of their products; governmental bodies with a responsibility for farm sanitary requirements; guidance produced to help train farmers in Germany and the Pig Site, an online international resource and community for those who keep pigs.

The majority of the potential best practice guidance identified was produced with at least some stakeholder involvement. All of the guidance identified would appear to be readily adaptable for use across the EU.

- **Product Type 4: Food and Feed Area Disinfectants**

Total no. of documents identified for the PT	Potential best practice documents	Documents for industry/ professionals	Of which, standards	Documents for consumers/public
53	20	20	9	3

In total, 53 documents appeared to be possibly relevant to food and feed area disinfectants. Of these, 20 documents were considered to be potential best practice.

The majority of the documents are written for professional use, and they include 9 standards. The documents cover a broad range of sectors (school, prison, housing, community and care) where best practice for food and feed area disinfectants is discussed.

[27] A range of additional documents produced by a corporation active in the field of PT3 biocides were identified at the very end of the work on this study. Unfortunately, it was not possible to include them in the count.

- **Product Type 5: Drinking Water Disinfectants**

Total no. of documents identified for the PT	Potential best practice documents	Documents for industry/ professionals	Of which, standards	Documents for consumers/public
17	4	4	2	3

Seventeen items of guidance with some relevance to PT5 biocides were identified. The majority of these documents, however, concerned the use of biocides in general. Only four documents provide potential best practice for PT5 biocides.

One document that covers several PTs is part of a series of fact sheets prepared by the National Institute for Health and Environment (RIVM) in the Netherlands. These fact sheets assess the risk of the use of biocidal products by the consumer. Their results are linked to a computer programme, ConsExpo (Consumer Exposure). Each fact sheet describes a set of similar products;[28] one of them covers the use of different disinfectants, including disinfectants for drinking water, swimming pools, waterbeds, chemical toilets and rubbish bins and is thus relevant to several PTs, including PT5.

- **Product Type 6: In-can preservatives**

Total no. of documents identified for the PT	Potential best practice documents	Documents for industry/ professionals	Of which, standards	Documents for consumers/public
11	0	0	0	0

We identified 11 items of guidance with some relevance to the PT6 biocides. All of these documents, however, were cross-cutting: i.e. none focused on the use of PT6 biocides.

- **Product Type 7: Film preservatives**

Total no. of documents identified for the PT	Potential best practice documents	Documents for industry/ professionals	Of which, standards	Documents for consumers/public
10	0	0	0	0

In total, the consultation process indicated only 10 items of guidance with some relevance to the PT7 biocides. As for PT6, all of these documents were cross-cutting and none focused on the use of PT7 biocides.

- **Product Type 8: Wood Preservatives**

Total no. of documents identified for the PT	Potential best practice documents	Documents for industry/ professionals	Of which, standards	Documents for consumers/public
79	37	37	22	16

[28] 2006 RIVM Disinfectant Products Fact Sheet, p.2.

The consultation process has identified 79 items of guidance with some relevance to the use of wood preservatives. In total, 37 documents appear to be relevant in terms of best practice. These include 22 national or internationally recognised standards.

Detailed and wide-ranging best practice guidance has been identified from the UK, Germany and North America. This guidance covers products for the industrial treatment of wood by pressure and vacuum methods, as well as products for surface treatment by professional and consumer users. Most guidance sets out how best to meet regulatory requirements. However, some goes beyond this, covering compliance with a range of different legislation in a single document, offering guidance on how best to apply the principles set out in legislation for different user types and product applications.

Only three items of best practice were designed with consumers in mind. When asked about guidance for consumers as part of this study, one product manufacturer stated that consumer guidance was primarily provided by product packaging and labelling rather than via the stand-alone guidance provided to professional users. The label and packaging guidance, if followed, was considered sufficient for the safe use of these products. Other reasons for producing guidance included ensuring that the most appropriate and least toxic product is used only where necessary, and to support the wood treatment industry through the promotion of the use of treated wood and wood treatments.

The majority of the best practice guidance was produced with at least some stakeholder involvement. The guidance that focuses on the practical use of specific products may be readily adaptable for use throughout the EU. The guidance that focuses on product specifications may serve as a model for use across the EU; however, different versions may be needed for each Member State.

- **Product Type 9: Fibre, leather, rubber and polymerised materials preservatives**

Total no. of documents identified for the PT	Potential best practice documents	Documents for industry/ professionals	Of which, standards	Documents for consumers/public
8	1	1	1	0

The consultation process identified 8 items of guidance with some relevance to the use of PT9 biocides. Of these, the only one assessed as potential best practice is the JRC's BREF on tanning,[29] which makes only a few passing references to biocides: it calls for the use of biocidal products with the lowest toxicological and environmental impacts and at the lowest concentrations possible.[30]

- **Product Type 10: Masonry Preservatives**

Total no. of documents identified for the PT	Potential best practice documents	Documents for industry/ professionals	Of which, standards	Documents for consumers/public
15	1	1	0	0

[29] European Commission (2003). BREF (02.2003) Tanning of Hides and Skins.

[30] This review noted that the BREF on textiles refers to the use of biocides in auxiliary chemicals in the production process (thus not PT9), as well as biocides for moth protection, odour suppression and other anti-microbial finishes (section 8.8.2). This BREF does not, however, contain specific recommendations on reducing the application of these biocides or using those with lower impacts.

There are 15 items of guidance relevant to the use of PT10 biocides. Nearly all of these, though, are cross-cutting documents. Two documents are only available if purchased and thus it has not been possible to review these.

As a result, only one potential best practice document has been identified: "Personal Health Protection During the Application of Antifouling Paints". This was prepared by CEPE, the European association of producers of paints, printing inks and artists' colours; it provides recommendations for health protection to reduce exposure in the application of antifouling paints. It thus could include paints containing PT10 biocides (as well as those related to PT7 and PT21). The CEPE document provides recommendations to reduce exposure.

- **Product Type 11: Cooling Water Biocides**

Total no. of documents identified for the PT	Potential best practice documents	Documents for industry/ professionals	Of which, standards	Documents for consumers/public
17	9	9	4	0

The consultation process identified a total of 17 documents that referred to PT11 biocides, of which nine documents had some relevance for best practices for their use.

Among these 17, the BREF document for industrial cooling systems provides detailed guidance on best operation techniques. The Health and Safety Executive (HSE 2003) is a useful guidance document on how to handle concentrates in water treatment where, for example, the use of automated dispensing systems or of solid chemicals is recommended. HSE (2000) also comprises an approved code of practice and guidance document for the control of Legionella bacteria in water systems.

Two existing EN standards focus on corrosion and efficacy testing. There are also national cooling water guidelines. The German VGB Cooling water guideline recommends operation procedures which reduce the fouling of cooling systems and therefore the amount of biocides required. There are also several standard books on engineering and technical aspects on cooling systems and other documents provide background information on the use of biocides in liquid cooling systems.

- **Product Type 12: Slimicides**

Total no. of documents identified for the PT	Potential best practice documents	Documents for industry/ professionals	Of which, standards	Documents for consumers/public
11	1	1	1	0

The consultation process identified 11 documents potentially relevant to slimicides. Of these, however, only one was considered potential best practice documents: the BREF on the pulp and paper industry has a brief discussion of the use of slimicides for the process water circuits (process aids) dealing with slime (defined as biological matter and connected chemical deposits, settled anywhere in the system). The annex to the BREF goes on to discuss the release of biocides to the environment. It reviews various approaches for the use of biocides in pulp and paper plants, identifying methods that reduce the amounts applied. Indeed, the BREF notes that "In a few cases, paper mills succeeded in production with total omission of biocides."

- **Product Type 13: Metalworking Fluid Preservatives**

Total no. of documents identified for the PT	Potential best practice documents	Documents for industry/ professionals	Of which, standards	Documents for consumers/public
32	11	11	6	0

The consultation process identified 11 potential best practice documents for the use of metalworking fluid preservatives out of a total of 32 documents identified for this PT. Among the potential best practice documents are codes of best practice and technical rules provided by national authorities, industrial organisations or employers' liability insurance associations. This includes six national or international standards documents.

Most of these documents have been developed in the context of occupational health, related to the biological agents regulation by authorities and occupational insurance associations. Several guidance documents describe the benefits of improved metalworking fluid management as part of good housekeeping. Most of the 11 documents focus on process optimization, and problems arising from the use of biocides are given little emphasis. There are also documents which cover very specific aspects of metalworking fluids such as the efficacy of different biocides for the control of *Mycobacteria* or physical treatment techniques (UV radiation, ultrasonic sound, ozone treatment) for the control of microorganisms.

- **Product Type 14: Rodenticides**

Total no. of documents identified for the PT	Potential best practice documents	Documents for industry/ professionals	Of which, standards	Documents for consumers/public
89	41	32	3	14

The consultation process has identified 89 items of guidance with possible relevance to the use of rodenticides. Of these, 41 documents were considered to be potential best practice. These include three national or internationally recognised standards.
Detailed and wide-ranging potential best practice guidance has been identified from the UK, Germany, France, Belgium and North America and from international organisations such as the World Health Organisation (WHO). These documents cover all aspects of rodent control, including methods to prevent infestation and alternatives to pesticides, as well as the use of biocidal products.

The guidance is designed for both professional and consumer users. The guidance for professionals is generally more detailed and complex. Among the documents for consumers, one interesting development is the use of interactive games and quizzes as well as videos to aid communication.

Guidance has been developed for a number of reasons, including:

- to set out legal requirements, good practice and best practice in one easily accessed form;
- to encourage users, mostly consumers, to follow the use instructions supplied with biocidal products, including rodenticides;
- to provide application specific guidance on the use of biocidal products generally, including detailed guidance on the use of rodenticides; and
- to provide comprehensive guidance on the use of rodenticides in a single manual for professional users.

The majority of the potential best practice guidance was produced with at least some stakeholder involvement and should be readily adaptable for use across the EU.

- **Product Type 15: Avicides**

Total no. of documents identified for the PT	Potential best practice documents	Documents for industry/ professionals	Of which, standards	Documents for consumers/public
24	2	2	0	0

The consultation process has identified 24 items of guidance with possible relevance, however only two documents directly address the use of PT15 biocides and were identified as potential best practice guidance. In sum, very little guidance has been found relating to the use of avicides. The guidance that has been identified focuses primarily on non-biocidal pest prevention and control methods, such as removing food sources, disrupting breeding, trapping or shooting and advises against the use of biocides to control birds. The use of avicides is mentioned only as a possibility for professional users.

- **Product Type 16: Molluscicides**

No active ingredients are agreed at Community level for inclusion in biocidal products of this type as set out in Annex I, Annex IA or Annex IB of the Biocidal Products Directive 98/8/EC. For this reason, no biocidal products of this product type may legally be placed on the market in the EU and PT16 is not considered further here.

- **Product Type 17: Piscicides**

Total no. of documents identified for the PT	Potential best practice documents	Documents for industry/ professionals	Of which, standards	Documents for consumers/public
16	2	2	0	0

In total, 16 documents have been identified in relation to this PT: most of these cover all product types or refer to several pest control PTs. Only two documents have been identified which directly address the use of piscicides. (One possible reason for the low number of documents is that in some Member States, such as Germany, the application of piscicides is forbidden by national law for animal protection reasons.)

One document comes from the US, where the Environmental Protection Agency has developed strategies to contain and neutralize piscicides after application. OSPAR (1994) provided a Best Environmental Practice (BEP) for the reduction of inputs of potentially toxic chemicals for aquaculture use, which could serve as a starting point for best practice guidance for this product type.

- **Product Type 18: Insecticides, Acaricides and Products to Control Other Arthropods**

Total no. of documents identified for the PT	Potential best practice documents	Documents for industry/ professionals	Of which, standards	Documents for consumers/public
96	20	18	10	3

The consultation process identified 96 documents of guidance that are possibly relevant to the use of PT18 biocides. The review, however, only judged 20 documents as potential best practice, of which 10 are national or international standards. The other 10 documents that appear to be relevant in terms of best practice are of three different types:

- Guidance focusing on the use of PT18 biocides for public health reasons (vector control, insect-borne diseases);
- Guidance related to the use of PT18 biocides for animals (pets, livestock pest management);
- Guidance for consumers, including alternatives to biocidal products.

A few of these documents identify preventive measures that could avoid the use of biocides. Some cover the application of insecticides as well as their disposal, or pre-treatment measures. In general, these guidelines were elaborated without the consultation of stakeholders. They can all be expanded to the EU since they provide general requirements that are not country specific.

- **Product Type 19: Repellents and Attractants**

Total no. of documents identified for the PT	Potential best practice documents	Documents for industry/ professionals	Of which, standards	Documents for consumers/public
42	11	9	0	8

Of the 42 documents identified, 11 were considered potential best practices for the use phase of PT19. These documents show great diversity.

One interesting format is that of courses for property managers, including public housing authorities. The course on 'Integrated Pest Management in Multi-Family Housing', which has been developed by the National Centre for Healthy Housing (US), includes awareness and risk reduction actions (this document is also relevant to a few other PTs in main group 3). The educational part of this document covers information on the types of pests that occur in households; it also reviews planning and practical issues, such as reading labels. Related elements focus on cooperation with homeowners and others to implement a systematic integrated pest management program to control pests in a sustainable manner.

- **Product Type 20: Preservatives for Food or Feedstocks**

In the proposed Regulation on Biocidal Products, which would replace the current directive, this product type has been removed as these products are covered by separate EU legislation on food safety, including legislation on food and feed additives. No further assessment has therefore been carried out.

- **Product Type 21: Antifouling Products**

Total no. of documents identified for the PT	Potential best practice documents	Documents for industry/ professionals	Of which, standards	Documents for consumers/public
25	14	13	3	7

The consultation process has identified 25 items of guidance with possible relevance to the use of biocidal antifouling products (PT 21). Of these, 14 documents were considered to be potential best practice. These include detailed and wide-ranging guidance relating to the use and removal of antifouling products; these documents come from the UK, Germany, Finland, and Australia and New Zealand as well as international guidance produced by the International Maritime Organisation (IMO). The documents include advice on choosing an antifouling product, applying antifouling products, maintaining boats so as to minimise releases of antifouling products into the environment and removing antifouling products, both obsolete and currently available products.

Most documents are written with professional users in mind. However, six of these are suitable for and accessible to consumers. One document focuses on consumers rather than professionals. The majority of the potential best practice guidance identified was produced with at least some stakeholder involvement. The guidance identified would appear to be readily adaptable for use across the EU.

- **Product Type 22: Embalming and Taxidermist Fluids**

Total no. of documents identified for the PT	Potential best practice documents	Documents for industry/ professionals	Of which, standards	Documents for consumers/public
7	2	2	0	0

The consultation process has identified seven items of guidance with some relevance to the use of embalming fluids. Of these, two potential best practice guidance. These two items, from the UK and France, provide health and safety information on the use of embalming fluids by professional users.

- **Product Type 23: Control of Other Vertebrates**

Total no. of documents identified for the PT	Potential best practice documents	Documents for industry/ professionals	Of which, standards	Documents for consumers/public
24	6	6	0	0

The consultation process has identified 24 items of guidance with possible relevance to the use of PT23 biocides. Of these, six documents set out potential best practice. Five of these also cover other PTs, in particular for rodents. Only one document is exclusive to PT23: this relates to the control of moles.

- **Cross-cutting**

Total no. of cross-cutting documents identified	Potential best practice documents	Documents for industry/ professionals	Of which, standards	Documents for consumers/public
39	17	14	0	10

Many of the documents identified in the first stage of the project cover more than one PT. Of these, 39 cover a broad range of product types. Those identified as "cross-cutting" met two criteria: (1) guidance that covered more than five PTs (2) across at least two main groups.

The review of the 30 cross-cutting documents identified 17 as potential best practice guidance for the use of biocides. For the purpose of this analysis, they have been grouped into four categories:

Detailed strategies on the control of harmful organisms for specific situations, e.g., housing, food industry installations, and schools

Three guidance documents provide details of how to control pests in specific situations. The IPM Manual for Schools found on the US EPA website is an outstanding example of best practices. It reviews the types of harmful organisms that schools may have to manage, from ants to wood-damaging pests, and provides easy

to follow methods for control, starting with non-chemical methods and advising use of chemical pesticides only when necessary.

Two other documents also provide very useful guidance. They review the types of harmful organisms most often found in those sectors and discuss how to prevent infestations of harmful organisms. They then review non-chemical control methods before describing methods using chemicals for control. The section on chemical control methods reviews types of pesticides and precautions to be taken in each case, in order to prevent health and environmental problems. The manual on alternative methods to biocidal control of harmful organisms prepared by the German Environmental Agency is also a useful resource for considering non-chemical alternatives.

Awareness raising information aimed at the general consumer as well as professional user

This type of guidance is aimed at the general consumer and professional user. For example, the US EPA website provides an easy-to-understand citizens' guide to pest control, a series of fact sheets about IPM and its various applications, tips for safe use of pesticides and other resources for management of harmful organisms.

The UK Environment Agency has a webpage on "home and garden pesticides and biocides". The information is limited to advice on how to dispose of old pesticides and pesticide containers safely.

The PAN North America website is also a useful resource of information on non-chemical pest control systems and safe use of chemicals for pest control when necessary.

Codes of conduct for professional users

Among the cross-cutting documents were several codes of conduct for professional users. A notable example is the AISE Charter for Sustainable Cleaning. The Charter is promoted by the AISE and is designed to go beyond basic legal requirements. It has two main elements:

- a set of 'sustainability procedures', based on ISO 14000 and other standards, which apply to the design, raw material use, manufacture and consumer use of products; and
- an annual report by AISE detailing the industry's progress against 10 key performance indicators.

Companies committed to the Charter provide annual data reports, which are independently verified at key stages. (The Charter goes beyond biocides and is reviewed further in the section on other best practices.)

Detailed guidelines on safe application methods, e.g., during fumigation and other professional situations

Guidance documents in this category are all aimed at reducing risk from use of biocides in the workplace.

One example is the detailed guideline prepared by the UK Health & Safety Executive for employers and technicians carrying out fumigation operations. This reviews the duties required under the Control of Substances Hazardous to Health Regulations 2002 (COSHH) and necessary compliance measures. The guidance from the Health & Safety Agency for Northern Ireland on *Control of substances hazardous to health in operations using fumigant gases* is similar.

The guidance from the Health & Safety Agency for Northern Ireland on *The safe use of pesticides for non-agricultural purpose* is an Approved Code of Practice with special legal status. It provides detailed guidelines for employers and independent workers using pesticides for non-agricultural purposes. If a professional user is prosecuted for breach of health and safety law and it is proven that the relevant provisions of the Code were not followed, the user will be found at fault unless s/he can show compliance with the law in some other way.

The Federal Institute for Occupational Safety and Health (BAuA) of Germany has also produced a detailed guidance document on use of biocidal products in the work place which appears to go beyond legislative requirements.

Finally, the UK HSE guidance on *Reporting incidents of exposure to pesticides and veterinary medicines* describes the types of situations where exposure might occur and the types of potential health problems that should be reported to authorities in order to monitor impacts of health from pesticides in general.

4 Analysis of approaches for best practice guidelines for sustainable use

A series of interviews were carried out with organisations preparing best practice documents. The interviews sought to gather in-depth information on:

- the reasons for preparing these guidelines;
- the approaches used in preparation;
- the methods for dissemination;
- mechanisms to monitor the uptake and results of the best practices; and
- the costs and benefits of best practices.

The interviews thus sought to gather information that could be used in developing policy options for the European Commission. Moreover, the interviews asked for information that could be used to assess the effectiveness of best practices as a tool to promote sustainable use.

In total, 18 organisations were interviewed; some of the interviews discussed more than one potential best practice document. Table 4.1 provides an overview of the organisations that were interviewed.

Table 4.1 Overview of the interviews carried out

Type of organisation	Interviews carried out: organisation and Member State or country
Government bodies	• Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (DE) • Essex Health Protection Unit (UK; with Health Protection Agency) • Health and Safety Executive (UK) • Leefmilieu Service – Risicobeheersing (Federal Level Belgium) (BE) • National Institute for Public Health and the Environment (NL) • Vereinigung der Metall-Berufsgenossenschaften (DE)
Industry associations	• AISE, International Association for Soaps, Detergents and Maintenance Products (EU) • Deutsche Gesellschaft fur das Badewesen e.V. (DE) • Technische Vereinigung der Grosskraftwerkbetreiber e.V.(DE) • Verein Deutscher Ingenieure (VDI) e.V. (DE) • Wood Protection Association (UK)
Professional associations	• Chartered Institute of Environmental Health (CIEH), National Pest Advisory Panel (NPAP) (UK) • Confédération des Professionnels du Funéraire et de la Marbrerie (FR)
Standards organisations	• British Standards Institute (BSI) (UK) • Deutsches Institute für Normung e. V. (DE)
Other	• The Green Blue (UK) (NGO) • Northeastern IPM Center, Cornell University (US) (Academic/Government Centre) • PAN Germany (DE) (NGO)

4.1 Developing best practice (process and participation)

Objectives of best practice documents

The interviews identified a broad range of objectives for best practice documents (see the table to the right). The *protection of human health* is the most common objective, through two main approaches: the effective use of biocides against harmful organisms; and the reduction of human exposure to biocides. The *protection of the environment* was another frequent, though less common, objective.

Common objectives for best practice documents
Protecting human health through the effective use of biocides
Protecting human health by reducing exposure to biocides
Protecting the environment
Cost savings for professional and industrial users
For standards: establishing common industry standards

Many of the best practice documents destined for professional users or industry also sought to *reduce costs*, in some cases via the reduction of biocide consumption.

Definitions of sustainable use

One notable result from the interviews with Member State bodies and stakeholders is that none of the organisations contacted had developed a definition of the sustainable use of biocides.

As seen above, the broad objectives of many documents coincide with elements of sustainable use, including the protection of human health and the environment. A number of interviewees identified other possible links with sustainable use (see the box below).

Linking standards for wood preservatives with sustainability

One respondent for a standards organisation suggested that their document assisted a more sustainable use of wood preservatives, primarily by promoting the use of the optimum level of PT8 biocides. At an optimum level, companies apply the minimal amount of wood preservatives to produce a product with a long, predictable service life, which also reduces the need for remedial treatment with biocide. It was argued that treated softwoods, often sourced from Europe, provide an environmentally favourable alternative to imported hardwoods, which are often from tropical forests, and also to the use of alternative materials, such as metal or plastic. It was also noted that wood preservation needs to consider climate change effects: for example, climate change is linked to the northward spread of pests such as termites. (These issues are likely to be addressed in an update to the standards.) In addition, the links between these best practice guidance and training were seen as important. Furthermore, this respondent noted that the industry in the UK is well controlled, both by government and also by industry bodies. (The links with regulatory structures are described in Section 4.5.)

The interviews included AISE, the international Association for Soaps, Detergents and Maintenance Products, in particular for their Charter for Sustainable Cleaning. This and related AISE documents cover biocides as well as other aspects of cleaning products, and they are reviewed both here and more generally in Section 5.1 on other policy areas. The AISE charter has economic, social and environmental goals; social goals include "guarding health, hygiene, safety and well-being among consumers and stakeholders"; environmental goals include "a voluntary, progressive reduction in ecological impact and resource intensity".

Government bodies preparing best practice documents

In all the interviews with government bodies, better protection of *human health* was identified as an expected benefit of the documents. Documents such as the series of guidelines on infection control in the UK (PT4 biocides) focus on the effective use of biocides against harmful organisms. Other documents seek to reduce potentially harmful exposure to biocides. The RIVM tool does so by assisting authorities to estimate risks related to exposure.

In other interviews, protection of the *environment* was identified as an objective. For example, in Germany a Technical Rule for Hazardous Substances (TRGS 525), prepared by BAuA, calls for environmental aspects to be considered in the choice of disinfectants for public health areas, along with medical and occupational health aspects. Health and environmental objectives are often combined; another technical rule in Germany on fumigation (TRGS 523) calls for pest control to be undertaken in ways that avoid or reduce deleterious effect on human beings and the environment.

In several interviews with government authorities in Germany and the UK, better or more uniform *compliance* was an objective. In two cases, best practice documents sought to *reduce costs* for industry and government by improving compliance and making enforcement more efficient, for example by specifying practices that enterprises should follow to remain within the law.

Other organisations preparing best practice documents

Enhanced protection of *human health* is a common goal for other organisations preparing best practice guidance. The more effective use of biocides to reduce infections is an objective for the BSI standards for chemical disinfectants and antiseptics. In another case, the effective use of biocides is combined with a concern for their possible health effects; this is seen in German standards that promote more efficient methods of swimming pool water treatment and better monitoring. Here, the standards identify minimum levels of treatment, i.e. biocide concentrations, which are effective as well as maximum levels that are considered "safe" for swimmers, along with recommendations for non-chemical actions. Several documents seek to reduce the quantities of biocides used, both for human health and *environmental protection* objectives.

While other standardisation and professional organisations interviewed referred to *environmental protection* goals, the approach varies. In the case of best practice guidelines for wood preservatives (PT8), for example, the organisation preparing the guidelines sees effective preservation as a method to reduce timber consumption.

Several professional and standardisation organisations referred to *cost savings* as an objective. For example, guidance on metal-working fluids is intended to reduce industry costs by optimising the amount of fluids and biocides used. Three respondents indicated that implementation of their guidelines brought better *compliance* with rules imposed by authorities, and thus reduced costs related to legal sanctions.

A number of respondents in these categories also referred to the establishment or raising of *common performance standards* and approaches within industry; for example, in respect to wood preservation and timber treatment, the maintenance and hygiene control of ventilation and air-conditioning systems and planning and construction methods. For other guidance, the standardisation of precautionary measures was among the objectives. For example, AISE identified a need to develop uniform pictograms for cleaning products at European scale to harmonise the different icons used for consumer cleaning products.

In several cases, best practice guidance was developed to assist industry in standardising practices. This was the case of standards for wood preservatives (PT8), developed as an industry response to the Construction Products Directive (Directive (89/106/EEC). This Directive identifies several ways in which its requirements can be specified in practice, including the development of harmonised EU standards**.**

Reasons for preparation: responding to user needs and requests

Most of the organisations interviewed, including both government bodies and others, reported that they prepared best practice documents as a service to biocide users or other stakeholders, in several cases in response to requests by users. Several guidance documents were prepared following requests by specific categories of users, such as local authorities. The RIVM tool (which covers a range of chemicals used in consumer products including biocides) was developed following repeated requests from authorities for assistance in calculating exposure levels.

In other cases, government bodies and other organisations developed guidance where they identified a need on the part of users. A UK NGO identified a need to provide sound advice to boat owners and supporting industries such as boat yards as their primary reason for developing such guidance (its work was supported by Defra). A German NGO has prepared guidance documents to support the availability of information on the physical, biological, and chemical and other measures as alternatives or for minimising the use of biocidal products, as is required by German Chemical Law.[31] The overall objective is to promote preventive behaviour, the use of non-chemical measures and the reduction of use of harmful substances at the non-professional level.

Other groups preparing best practice documents also indicated that they did so to address a lack of available guidance for users on the subject**.** For example, this was the motivation for a guidance document on treated wood, prepared in the UK by a professional association, aimed to provide designers and architects with specifications regarding treated wood and its use in construction.

Geographic scope of best practices

Most of the guidance documents that were the subject of interviews had a *national* scope. This was the case across the different categories of organisations preparing guidance, including government bodies, many professional and standardisation organisations as well as the NGO contacted. For example, the tool for calculating exposure developed by RIVM in the Netherlands was based on average conditions (e.g. room size, body weight) in that country. In the case of one government body, guidance was originally aimed at local (county) level in the UK, but its scope was then expanded to national level, following endorsement by HPA.

Two documents were intended for use at European level:

- A UK standardisation body, BSI, developed guidance for PT8 biocides based on CEN standards;
- A Germany professional association developed guidance intended to be European in scope.

Updating existing best practice documents

The interviews indicated that, in many cases, regular updates are needed for best practice documents to keep abreast of technical and regulatory developments.

Government bodies

Most of the government bodies interviewed indicated that they had plans to update their guidance, though none indicated a fixed schedule. For example, a government organisation in the UK reported that it

[31] §22 (5) Chemikaliengesetz (ChemG) from 2 Juli 2008. See http://bundesrecht.juris.de/bundesrecht/chemg/gesamt.pdf.

constantly reviews and extends or adapts its best practice documents in response to changes in products, use or knowledge of health issues.
Some interviews provided information on the reasons for updates: for one government body in the UK, for example, these could include legislative changes, the development of new guidance by other organisations and suggested improvements from users.

Other organisations

The two standards organisations interviewed both indicated that they regularly review their guidance on a fixed schedule, to see if updates are necessary (e.g. every five years). In addition, they may also make updates on the basis of recommendations by one of their committees, for example to take into account technical progress. Most of the professional associations interviewed also indicated that they regularly updated their guidance, though only one reported having a fixed schedule (every five years).

The reasons given for updates included changes in national and European standards, changes in legislation and changes in biocidal products and in biocide use practice.

Plans for new best practice documents

A few organisations indicated in the interviews that they had plans to develop additional best practice documents. Two groups are developing more specific best practice to supplement their existing documents. One professional organisation was in the process of developing a pest-specific guidance for PT18 (insecticides) to supplement its existing documents in this area. An NGO indicated that additional guidance will be issued on the use of antifoulants to control non-native invasive species.

In the response to this question, an official at one government body replied that one of the main issues was a lack of research and development of alternatives to biocidal products and suggested that, before producing guidance documents, further scientific research and funding in this area was required. This assessment is based on research to prepare a national data base of scientific studies on the effectiveness of alternative methods to the use of biocides. The result was that hardly any research was identified. This limited the description of alternative methods in a government publication as many were not scientifically proven.

4.2 Use of participatory approaches in the development of best practice documents

By and large, the organisations contacted had consulted with key stakeholders and others when preparing their guidance (see Table 4.2).

Table 4.2 Approaches used for stakeholder consultation

Type of organisation	Types of stakeholder consultation
Government bodies	• Consultation of outside stakeholders • Various types: small working groups – open public consultation • Consultation of other government bodies • Feedback from user organisations
Other organisations	• Consultation of stakeholders and experts • Various types: working groups – circulation of draft in restricted groups – availability on website – open consultation • Different types of stakeholders (national or local authorities - industry organisations – trade unions – consumer organisation – EU)

Government bodies

Most government bodies involved outside stakeholders in the development of best practice documents. The methods varied, from small working groups to open public consultation.

In developing best practices for metal-working fluids, for example, a UK government body involved engineering manufacturers, an industry association and trade unions. In developing best practices for PT14 and PT18, including fumigation for control of harmful organisms as well as other operations, the same body involved the relevant industry associations, particularly the British Pest Control Association and professional bodies such as, CIEH/NPAP.

One government body (in Germany) held an open public consultation, via open submissions of written statements. In this case, the guidance was then elaborated by participants in a working group.

Only two government bodies, however, mentioned cooperation with other parts of government. One example was in the Netherlands, where a tool developed for exposure was intended for use by other government bodies. The German BAuA consults with other governmental and federal states authorities in the development of TRGS.

Other organisations

In most cases, other types of organisations preparing guidance also involved stakeholders and other experts, often through working groups (the box below provides an example from one case in Germany). A few organisations, in both the UK and Germany, published drafts for open comment. In at least one case, the draft document was made available on the web for open comment.

BG Metal in Germany: participation in the development of guidance for metalworking fluids

In Germany, the system of Social Accident Insurance plays an important role in the protection of worker health and safety in industry (see Section 4.6). In the metal-working industry (Berufsgenossenschaft Metall), working groups have developed several guidance documents on general hygiene measures for metal working fluids. These documents cover chemical or physical measures to prevent bacterial and fungal growth and the risk of infection, as well as the risk of allergenic reactions and toxic effects by endotoxins (e.g. BGI 76, BGR/GUV-R 143). The documents call for a variety of monitoring actions, including for pH, for the concentration of nitrite and for bacterial count. They call for the use of biocides to be limited to the necessary minimum. Moreover, maximum biocide concentrations in metal-working fluids should not be exceeded by repeated dosing.

These guidance documents are considered as describing the state of the art (i.e. best practices) and have no legally binding status, though they are used for training.

Working groups with broad participation help to draft the documents. The working groups are chaired by members of the BG and consist of federal government and local authorities, industry and industrial associations, labour unions, suppliers of metal-working liquids and biocides as well as the manufacturing industry. Draft guidance documents are submitted to participants and possible changes are discussed in the working group.

The types of stakeholders involved varied greatly. They included national and local authorities, industry associations and manufacturing companies in specific sectors (e.g. biocide manufacturers, often focusing on those for a specific PT) and trade unions.

One of the documents intended for the public took a further step. In this case, AISE employed a marketing company to carry out consumer research, specifically testing the guidance with a sample of consumers to check that it was easily and correctly understood.

In a few cases, however, interviewees indicated that no stakeholders or outside experts were involved. Moreover, the extent to which participation influenced the different guidelines is not clear. Only two respondents indicated that changes were made as a result, while another indicated that consultation did not result in any changes being made. No information was provided in the other interviews.

4.3 Dissemination of best practice

A key distinction is between the dissemination of best practice documents intended for professional users and those for the wider public. Documents for professional users were disseminated through a broad range of techniques, from web sites to trade fairs (see the table below).

For public users, dissemination via the web is common. Other methods included distribution of information via commercial magazines and innovative approaches such as computer-based games for young people.

Best practices for professional users

All government organisations reported that they disseminated their best practice documents via their websites. They also used a broad range of other dissemination methods (see Table 4.3).

Table 4.3: Dissemination methods for documents for industry and professional users used by government and other organisations

- websites
- emails to interested parties
- agreements with associations (for distribution to members)
- industry fairs/exhibitions
- sent to consumer magazines
- hard copies on request
- press releases
- publications by consultees
- via EU organisations that work on biocidal products
- workshops, seminars and technical training
- via industry associations (informally)
- via industry publications
- via publishers (in paper and disc formats)
- seminars/technical training
- word of mouth

Most government organisations that prepare guidance make the documents available for free on the Internet and in some cases at a low cost for hard copies. Most government organisations were responsible for dissemination themselves. In some cases, other organisations were involved, including other government departments and ministries, as well as the European Commission. In addition, German technical rules on hazardous substances are published in official ministerial journals.

Other organisations – standards organisations, industry and professional organisations and others – all reported using the web as the first means of dissemination to industry and professional users. A range of other methods were used. In at least two cases, this involved training programmes.

Best practices for the general public

In many cases, best practice methods for the general public are disseminated via the web. In Germany, the government has set up a web site with information on biocides (see the box below).

Web-based information system on biocide use in Germany

The German Federal Environmental Agency (UBA) has established a web-based information system for alternatives to biocide use. Other Federal bodies involved in biocides participated in the planning and development of the site.

The objective of the website is to provide detailed information on preventive and integrated control measures in areas where biocides are used. The web site helps to implement a requirement in Germany's Chemicals law, which prescribes that the licensing authorities for biocides shall make available to the public "information on the physical, biological, and chemical and other measures as alternatives or for minimising the use of biocidal products...".

The web site also provides a range of background information on biocidal products, on the implementation of the Biocidal Product Directive in Germany and on related topics. The main focus of the portal at present is on consumers, though more information for professional users is planned for the future. Guidance on the identification and control of pests is provided, along with practical advice for specific situations. The fields of disinfection, material protection and pest control are covered. Information from industry and NGO sources is included on the web site, following a quality check. A consultant identified initial information for the web site. The information provided is expected to grow steadily; at the time of this study (September 2010), many elements identified for the web site still had to go through the quality check, including information for professional users. In general, the web site intends to disseminate documents that are available; the development of new documents specifically for the site is not planned.

The web site was launched in July 2010, with a press event. A press release and a flyer describing the web site were prepared.

An English version of the content may be provided in the future, though this is not currently a priority.

In Belgium, the Federal government distributed a brochure on biocides and pesticides via a magazine, *Test Achats – Test Aankoop*, published by a national consumer group. The brochure, whose French title is *Biocides et pesticides : pas sans risques !*, describes alternative methods to the use of biocides and makes recommendations for their safer use.[32] It is available on the Federal government's website, while Test Achats / Aankoopp presents a summary of information on biocides and pesticides on its web site.[33]

Other organisations have also set up web sites that promote the use of best practices. One example is the German Sailing Association (DSV), which funds a web site on fouling and antifouling methods for professional und private users.[34]

[32] The Flemish title is: *Ongewenste gasten in je huis of tuin? Practische tips voor een mens- en milieuvriendelijke aanpak.*
[33] http://www.test-aankoop.be/ and http://www.test-achats.be/.
[34] See http://www.fouling-atlas.org.

A variety of other methods have been used. Guidance for boat enthusiasts prepared by a UK NGO was disseminated through a variety of methods; among others, it was publicised in trade and enthusiast magazines and promoted by word of mouth at public events. (This guidance is described further in Section 4.5.)

In the UK, the National Pest Advisory Panel of the Chartered Institute of Environmental Health developed an online game to provide information to the public (in particular young people) related to practices that can help to prevent rodent infestations; a more detailed DVD provides further information. The goal is to assist government bodies, pest control professionals and others in engaging with the public. (See the box below.)

Pesky pests: public information on pest control

The National Pest Advisory Panel (NPAP) of the UK Chartered Institute of Environmental Health (CIEH) produced documents on the use of PT14 biocides (rodenticides) in response to requests from local government pest control staff. This work thus fills a gap in readily available practical guidance. In preparing the guidance, consultations were held with key stakeholder organisations and the drafts were posted on the NPAP web site for comment. The guidance itself is available from the NPAP web site and it is distributed at trade events and informally during the professional activities of its members.

One recommendation in the best practice documents is to engage the public in the control of pests, including children and teenagers in schools. NPAP also developed a set of tools for this purpose. Among the communication tools developed is an online game, "Pesky Pests", available on the NPAP web site (http://multimedia.cieh.org/npapresources/peskypests/peskypests.html). In the game, participants are asked to identify 10 common factors that may encourage rodent infestation. Each time a factor is identified, a text box is displayed explaining why this factor, e.g. incorrectly stored food, may attract rodents. Items of good practice, such as a cleaned pet bowl, are also included and explained when identified. The aim is to help pest control professionals communicate to the public the measures that they can take to prevent infestation or to reduce the likelihood of re-infestation following treatment.

A DVD resource called "Pests on the Menu" has also been produced for public audiences: it provides more information than the simple online game.

4.4 The results of best practice: methods for monitoring, reported results

Best practices for professional users

Approaches to monitoring the uptake and use of best practice guidance documents vary greatly. Several organisations interviewed monitor only the distribution of their best practice documents, such as the number of web downloads or paper copy purchases. A few organisations report receiving informal feedback from stakeholders or users.

Several best practice documents prepared by government are linked to the regulatory structure, and their adoption by a facility may be assessed during inspections. Moreover, in Germany, some best practice documents for enterprises are considered during inspections for occupational health insurance schemes. Both of these approaches are considered more closely in the next section on links to the regulatory structure.

Best practices for public users

One NGO organisation carried out detailed monitoring of behavioural changes resulting from its guidance for boaters (see box).

The Green Blue (TGB)

The Green Blue, an environmental programme set up by two UK boating associations, employed consultants to assess the issues facing boating in the UK and identified a lack of guidance on the use of PT21 (antifouling products) as well as other chemicals. Documents were developed using information from the literature, advice from academic experts and feedback from stakeholders.

The documents are available from the TGB web site, emailed to potentially interested parties, included in the TGB Code of Practice, publicised in trade and enthusiast magazines, promoted at TGB events and provided to other organisations, including regulatory authorities, for them to use and adapt.

The Green Blue carried out a review of implementation (one requirement of the government funding for TGB was a comprehensive report on the level of behavioural change that resulted). For this review, 2,500 questionnaires were distributed. Three main routes were used: the TGB's contact list; trade and enthusiast events such as the National Boat Shows in the UK; and the British Marine Federation and the Royal Yachting Association magazines. To encourage participation, paper questionnaires were accompanied by a publicity pen and poster and every respondent was entered into a free prize draw.

A 30% response rate was achieved for the questionnaire, and it was followed up with 20 telephone interviews. The survey indicated that in terms of the influence of TGB activities on the environmentally responsible use of antifoulants (PT21) and other chemicals:

- 10% of respondents stated they were "doing a lot more"
- 27% were "doing a little more"
- A majority, 52%, were doing the same as before
- And 11% reported that they were "doing nothing"

The initiative thus has changed the behaviour of about 40% of the sample, a result that TGB respondents consider fairly good.

Estimates of results

A few respondents considered that significant risk reduction had been achieved, though none were able to provide numerical estimates:

- In Germany, the use of best practice documents in compulsory training for professional users was considered a mechanism for achieving risk reductions;
- One professional association in the UK considered that risk reduction had been achieved, based on positive internal feedback from users.

Estimates of cost savings

Several respondents indicated that their best practice guidelines had led to cost savings for professional users. None, however, had quantitative estimates of these savings. Some of the respondents – from both industry and government organisations – indicated areas where costs are reduced. These include the following:

- Reduction in the amount of biocidal products used
- Reduction of ill health, for example through a reduction in infections

- Improved compliance with legal requirements
- Reduced liabilities, improved regulatory compliance and reduced litigation.

In some cases, respondents cited a range of cost savings. One professional association that prepared best practice guidelines for control of pests estimated that these yielded cost savings for pest control operators through greater efficiency, saving time and materials; for the industry sector through reduction of legal liabilities; and for the housing sector through reduction of future pest control costs.

Estimates of costs for implementing best practice for professional and industry users

Several respondents identified possible costs related to the implementation of best practice documents, and their responses varied greatly:

- For guidance prepared in the UK for disinfectants, for example, it was estimated that adoption could involve higher costs due to the use of new products as well as additional staff time for cleaning
- The British Standards Institute estimated costs over £1 million (€1.2 million) across 500 UK companies for the introduction of its standards on wood preservatives, while the same organisation indicated no costs to users in respect of its guidance on chemical disinfectants and antiseptics
- A respondent at a professional association developing best practices for pest control estimated that there would be costs to professional operators and industry sector users if they did not already follow good practice, otherwise the cost was minimal.

Estimates of implementation costs for consumers

The main cost for implementation of the Green Blue's guidance for boat owners was considered to be for the safe disposal of paint scrapings**.** It was estimated that there would be no costs to consumers for following the Belgian best practices guidance for the general public on the use of pesticides and biocides.

4.5 Link between best practice and overall regulatory structure

The responses from government bodies as well as others organisations indicated that many best practice documents for professional users are closely linked to legal requirements. Some documents provide detail to help industry and professionals comply with regulations; others fill gaps in the law. While these documents are not legislation, some are considered during facility inspections by government bodies and others.

In Germany, for example, guidance in the form of technical rules for hazardous substances is intended to help enterprises comply with the law. This guidance, prepared by a government body (BAuA), is considered as a complementary tool to legally binding measures and provides more details than legal requirements. In another example in Germany, national law sets requirements for swimming and bathing water but does not provide relevant technical standards; this gap in the law led to a standardisation organisation to develop such standards.

In the UK, guidance prepared by HSE is linked to broad legislative requirements for the protection of health and the environment and is intended to assist enterprises to comply with these broad requirements (this topic is described further in the box below on HSE and the regulatory structure in the UK).

Links between best practice documents and facility inspections

In several cases, the use of specific best practice guidelines is considered when facilities are inspected by public authorities and others. This is the case, for example, for guidance prepared by HSE in the UK (see the box below).

Links between best practice documents prepared by the UK Health and Safety Executive (HSE) and the regulatory structure

The HSE enforces UK legislation on health and safety and on the working environment. Its goal is to improve health and safety performance (http://www.hse.gov.uk/strategy/strategy09.pdf), and its "mission is to prevent death, injury and ill health in Britain's workplaces". Much of the UK legislation sets out broad requirements to help meet this goal.

The Control of Substances Hazardous to Health (COSHH) Regulations, for example, require employers to ensure that the exposure of employees to substances hazardous to health is either prevented or, where this is not reasonably practicable, adequately controlled. So far as is reasonably practicable, they must avoid the use of a substance hazardous to health at the workplace by replacing it with a substance or process which, either eliminates or reduces the risk to the health. Where it is not reasonably practicable, the employer must apply protection measures appropriate to the activity and consistent with the risk assessment.

The HSE develops guidance to assist industry to fulfil these legal obligations; for example, guidance on the safe use of metal-working fluids includes measures to control hazards from biocidal additives in the fluids. Most guidance on the use of biocidal products is available on the HSE web site, on web pages for COSHH where they are arranged by industry or workplace activity (e.g. metal-working industries or fumigation activities).

The HSE's best practice guidance documents are effectively an interpretation of the broad requirements of the legislation. The HSE guidance on Code of Practice for using Plant Protection Products, for example, states that:

> "The code has a special position in law. If you follow its advice you will be doing enough to keep within the law. But you may be able to work in a different way from the code as long as that way is just as safe." (http://www.pesticides.gov.uk/safe_use.asp?id=64)

Thus guidance has a semi-legal role. The guidance format allows a more flexible procedure, however, than legislation or a standardisation process. Indeed, HSE inspectors also disseminate guidance during their inspection activities. At the same time, the documents can play a legal role. The Code of Practice for using Plant Protection Products also states that:

> "The Code's statutory basis means that it can be used in evidence if people are taken to Court for offences involving pesticides." (http://www.pesticides.gov.uk/safe_use.asp?id=64)

In Germany, several best practice documents include provisions for worker health and safety, and their implementation in enterprises is reviewed by local authorities and by occupational health institutions. This is the case for documents prepared by a government agency (BAuA) on hazardous substances, including biocides, as well as best practice guidelines on metal-working fluids prepared by an industry association (VMB) and a best practice document for PT2 biocides (VDI). The box below provides an overview of occupational health and safety policy in Germany and related inspections.

Occupational safety and health policy in Germany and its surveillance

In Germany, occupational safety and health policy is based on three pillars: the federal government, the social accident insurance institutions (Berufsgenossenschaften and Unfallkassen) and the state labour inspectorates of the 16 federal regions (Laender).

The German Federal Institute for Occupational Safety and Health (BAuA) is a government body under the Federal Ministry of Labour and Social Affairs. Its work includes the development of technical rules for hazardous substances (TRGS) and Technical rules for biological agents (TRBA), some of which are concerned with biocide use and biological agents. However, the BAuA is not directly engaged in monitoring workplaces. This task is shared among the social accident insurance institutions for different economic and public sectors and the state labour inspectorates of the states. The social accident insurance institutions have developed several guideline documents which are concerned with biocide use. Examples include guideline documents on hygiene measures for metal working fluids (BGI 762, GR/GUV-R 143) and on the handling and safe use of wood preservatives (BGI 736). These guidelines are considered as state of the art (i.e. best practices) although they do not have legally binding status. Thus, they are less mandatory than the TRGS but are used for training.

The social accident insurance institutions and state labour inspectorates divide workplace monitoring activities; for example, the institutions focus on prevention and occupational health while the state inspectorates control technical plant safety, emissions control, waste disposal and the transport of hazardous substances. The state labour inspectorates also focus on several special population groups such as young people and pregnant women.

The government body of the social accident insurance institutions is the German Social Accident Insurance Association (http://www.dguv.de). A web portal has been established to support the effective realisation of occupational safety and health in companies, especially in small and medium-sized enterprises, as part of the Joint German Occupational Safety and Health Strategy (see http://www.gefaehrdungsbeurteilung.de).

Links between best practice and training requirements

A number of best practice documents help to fulfil training requirements set out in legislation. This is the case for the USA requirements on integrated pest management (see the box below).

Training for the use of IPM in public housing in the US

In the USA, a 2009 Presidential Executive Order requires that Federal Agencies promote pollution prevention and waste reduction by implementing integrated pest management (IPM).[35] This requirement builds on previous legislation for the promotion of IPM. The Federal Fungicide Insecticide and Rodenticide Act, for example, calls for the promotion of IPM methods. In particular, the Agriculture Department is to undertake:

> "...research, demonstration, and education programs to support adoption of Integrated Pest Management ... make information on Integrated Pest Management widely available to pesticide

[35] Section 2 of an Executive Order 13514—Federal Leadership in Environmental, Energy, and Economic Performance available at: http://edocket.access.gpo.gov/2009/pdf/E9-24518.pdf

users, including Federal agencies. Federal agencies shall use Integrated Pest Management techniques in carrying out pest management activities and shall promote Integrated Pest Management through procurement and regulatory policies and other activities."[36]

In February 2006 the US Department of Housing and Urban Development issued a notice[37] to inform public housing agencies of a series of Integrated Pest Management guidebooks and encourage their use. A programme has been set up to provide on-line training to pest management professionals for IPM methods to be used in government-owned housing.

Best practice as a mechanism for sustainable use policies

Several EU Member States have included biocides along with pesticides in their National Action Plans (NAPs) currently being developed under the Sustainable Use Directive for pesticides.[38]

In 1998, Belgium adopted a Federal law whose provisions included the development of regular plans to reduce the use of pesticides and biocides.[39] The first programme was launched in 2005,[40] developed in coordination with stakeholders including local and regional administrative authorities, consumer groups, environmental NGOs and industry associations who participated in 14 working groups. It was updated in 2007-2008 and in 2009-2010.

The national programme maintains three priority areas:

- Development of assessment methods for the impact of biocides and pesticides
- Reduction of their risks
- Public communication and awareness.

Under the first area, studies were carried out on exposure to these products, risk indicators were established and statistics gathered on the use of agricultural pesticides. Much of the work on the second area focused on agricultural pesticides. In the third area, activities carried out included the brochure distributed via Test Achats / Aankoop (described above).

Belgium's programme also sets out quantitative goals for 2010:

- Reducing the impact of agricultural pesticides by 25%, compared to 2005
- Reducing the impact of biocides by 50%, compared to 2005.

This programme provides an example of actions carried out to achieve sustainable use, including both best practice documents as well as other activities.

[36] Title 7 USC 136r-1 Federal Fungicide Insecticide and Rodenticide Act
available at http://trac.syr.edu/laws/07/07USC00136r-1.html

[37] U.S. Department of Housing and Urban Development Office of Public and Indian Housing NOTICE PIH 2006 - 11 (HA) available at: http://www.hud.gov/offices/pih/publications/notices/06/pih2006-11.pdf

[38] Article 4 of Directive 2009/128/EC establishing a framework for Community action to achieve the sustainable use of pesticides, *OJ L 309, 24.11.2009, p. 71–86.*

[39] Loi du 21 Decembre 1998 relative aux normes produits ayant pour but la promotion de modes de production et de consommation durables et la protection de l'environnement et de la santé prévoit un programme de réduction fédéral devant être actualisé tous les deux ans. F. 99 — 362 [S − C − 98/22861]

[40] Arrêté royal relatif au premier programme de réduction des pesticides à usage agricole et des biocides; available at http://faolex.fao.org/docs/texts/bel50706.doc

4.6 The costs of developing, disseminating and updating best practice documents

Developing best practice documents

Three government organisations provided information on the cost of developing best practice documents. Their responses were as follows:

- For a brochure for the general public in Belgium, 50 person days of staff time plus €160,000 for printing and publication
- For a best practice document for professionals in the UK, approximately two months of staff time
- For a technical rule in Germany, 225 to 450 staff days.

The costs for best practice documents prepared by other bodies also varied. Among the information reported is the following:

- The cost of developing standards for PT8 biocides was £250,000 (about €300,000) over 6 years in the UK
- On the other hand, a code of practice for PT8 biocides developed by an industry association cost an estimated £20,000 (about €24,000 at current exchange rates) in the late 1990s for guidance production, £1,000 for annual updates and producing guidance CDs, and £5,000 (about €6,000) more recently for a round of modifications
- The broad-ranging AISE charter on sustainable cleaning that includes biocides cost about €2.5 million to set up in 2005, with update costs of €1.5 million
- Three German associations that developed best practice technical standards reported very different levels of costs: one reported approximately 30 staff days; a second, 54 person days plus travel costs and 1-2 committee discussion meetings; and a third, about 250-300 staff days
- In the US, the development of a training programme for IPM in public housing required an estimated 30 staff days plus printing costs (about €7 per binder)
- For one NGO, the development of best practice guidelines for a specialised sector of the public required an approximately £43,000 (€51,000) per year.

The costs differ greatly. This is related to a range of factors. One is the differences in size and complexity of the documents. Documents also vary greatly in scope, from a specific use that reflects a sub-type of one PT to details that cover several product types.

It should also be noted that organisations account for costs in different ways – for example, in some cases documents by industry or professional associations are produced via meetings whose participants do not charge the association for their time. In some cases the data and information needed to prepare a document may be readily available to the authors (e.g. CEN standards); in some cases it may need to be collated (e.g. The Green Blue); and in other cases it may require additional research.

Costs of dissemination

Only one government organisation provided information on the costs of dissemination: this is information provided to the general public. Approximately €50,000 was spent for dissemination to the public in Belgium of a brochure on pesticides and biocides.

For training on IPM in the US, the costs are estimated to be about $2,600 (about €2,100) for each training session.

Other respondents did not specify their dissemination costs.

Costs and process for updates

A few respondents provided information on the costs involved in updating best practice documents. For two industrial associations in Germany, updating was carried out by working groups. In the first of these cases, a group of about six experts met up to three times a year over the course of at least two years. A further two years of review and commenting occurs before publication. In the second case, 25 members meet at least 10 times for major changes (less for minor updates). A draft technical rule is then published and discussed among stakeholders. After the review and comments, the technical rule is published about one year after distributing the first draft.

5 Exploring options for best practice guidelines at the EU level

One of the objectives set out in the Technical Specifications is to provide the Commission with information regarding how the concept of best practice could be best adapted and used at the EU level.

Section 5.1 provides some ideas on how best practices can be used at the EU level by analysing the experience of examples of best practice in other policy areas. Section 5.2 further responds to this objective by identifying a number of options that the Commission could consider for promoting best practices for sustainable use of biocides throughout the Member States. Section 6 then provides a first estimation of the costs of these options.

5.1 Best practice in other policy areas

The first step in Task 3 (Exploiting the Potential of Best Practices at the Community Level) was the analysis of experience in other policy areas. A series of case study examples were prepared for a range of policy areas; these are provided in Appendix II to this report. Some of these areas were proposed by the project team (in particular in the Technical Proposal for this study); others by Commission services (including in the study's Specifications). Table 5.1 provides an overview of the examples.

Many of these examples on best practices come from environmental policy. Others, however, are taken from other policy areas, including health (soft drink marketing guidelines), drug abuse prevention (drug precursors) and worker health and safety (noise at work guidelines). While most of the examples are at EU level, two are taken from the UK, on pesticides and on nanotechnology. It should be noted that the AISE Charter on Sustainable Cleaning is included here, and is also reviewed in the Sections 3 and 4 in terms of biocides.

Most of the examples comprise specific guidelines. Three cases review the use of administrative mechanisms, including institutions, for bringing forward best practices; IMPEL, which works in the area of enforcement of EU environmental legislation; the Common Implementation Strategy, which has developed guidance for the Water Framework Directive; and the EU Organisation for Health and Safety at Work (OSHA).

Legal/institutional role of guidance

A preliminary hypothesis is that all of these best practices take place within a broader legal and policy context. In this view, best practices are not proposed and developed spontaneously. This appears to be confirmed by the review of the case study examples. At the same time, a variety of approaches can be seen in terms of the links between the best practices and legal/policy requirements.

- Some of the "best practices" are closely linked to legislation. This is the case, for example, for the IPPC BREFs, the guidance documents prepared under the Common Implementation Strategy for the Water Framework Directive and the guidance on drug precursors; in all these cases, the documents are an important element of work for the implementation of the legislation. Their use remains voluntary, however, the BREFs are cited directly in the Commission's proposed Industry Emissions Directive, which would replace the IPPC Directive as well as other legislation.

- Some initiatives have been developed as an alternative to binding legislation: this is the case notably for the UNESDA marketing guidelines on soft drinks, which were developed as a response to EU calls for action on obesity: the Commission indicated that binding legislation would be considered if industry did not undertake its own initiatives. In the sector of public health, a number of voluntary

approaches that bring together EU institutions, industry and other stakeholders have been launched as a way to address key problems; another example is the European Alcohol and Health Forum.

The other initiatives identified here do not have a direct link to legislation but nonetheless appear to respond to and play a role in a broader policy process. Thus, the AISE Sustainable Cleaning Charter was launched in response to the Commission's Green Paper on Integrated Product Policy as well as other EU policy initiatives, the UK Responsible NanoCode followed a review of nanotechnology by the Royal Society.

Objectives of the best practices

A further observation is that the best practices reviewed here are mechanisms for taking forward a broader policy goal, such as environmental protection and public health. Best practices can also be used within the context of initiatives for better regulation and smarter regulation. In these cases, the goal of the best practices appears to be that of achieving existing policy goals more cost-effectively.

Commitments and participation

There appear to be two main avenues. Many of the initiatives, in particular those developed by industry associations, require participating companies to make a commitment to the guidelines. This is the case, for example, for Vinyl 2010 and the Sustainable Cleaning Charter, as well as the UNESDA Marketing Guidelines. Some of these initiatives have explicit reporting mechanisms for each participating member and in some cases for the initiative as a whole. Such mechanisms provide at least some information regarding the results of the best practices.

Other initiatives do not require specific commitments. This is the case for several initiatives developed by EU institutions, such as the good practice guide on noise at work, which focuses on the entertainment industry. In these cases, there is little information available on the uptake and results of the guidance.

Public information

In nearly all cases, the guidelines as well as information on monitoring results related to their implementation are made publicly available. The main exception identified is the guidelines on drug precursors; these are considered to have sensitive information that could be of value for illegal activities and thus are not available to the public.

Table 5.1 Overview of case study examples of best practices in other policy areas

Best practice (title/issue)	**Objectives**	**Prepared by** • Government • Industry • Prof. Ass'n • Other	**Process of development:** • Consultation • Experts • Others	**Role of best practice in EU policy**	**Target group to use best practice:** • Government • Industry • Professionals • Consumers • Other	**Legal / institutional role of guidelines** • Cited in legislation? • Formal adherence? • Voluntary / mandatory?	**Type of guidelines:** • Standards • Technical rules • Code of practice	**Further notes** (e.g. extent of detail in BP; evaluation of results; other)
Guidelines								
UNESDA marketing guidelines – soft drinks and health	Industry commitment not to market soft drinks to children	Industry	*No information (appears to have been developed within UNESDA)*	Alternative to EU legislation	Direct target: UNESDA members (companies)	Industry developed guidelines as an alternative to binding EU legislation	Code of practice	UNESDA commissions third party monitoring
IPPC BAT Reference Documents (BREFs) – Industrial emissions	Information for setting permits	EU institution	Consultation with industry, NGOs, government	Directly supports implementation of IPPC Directive	Government (permitting authorities) and industry	Not cited in current IPPC, COM proposal for revision calls for use of BREFs in permitting	Technical description and analysis	Extensive technical analysis
A.I.S.E Charter for sustainable cleaning	Response to Green Paper on Integrated Product Policy + other policies	Industry	Developed in consultation with EU Commission (DG Enterprise, DG Health & Consumer Protection, DG Environment), individual Members of the European Parliament, UNEP, NGOs and independent sustainability consultants.		Direct targets: companies placing detergents on the market, and retailers.	Industry voluntary initiative	Charter laying out procedures to be implemented	Implementation allows use of Charter logo
EU Guidelines on Drug precursors	Support co-operation between Competent Authorities and economic operators	European Commission	Developed with representatives of CAs from MS and in co-operation with industry, distributor representatives and Europol.	Support implementation of EU legal framework for drug precursors (Regulation 111/2005/EC and 273/2004/EC).	Companies dealing with drug precursors.	Cited in Regulations 111/2005/EC and 273/2004/EC.	Practical guidelines	Guidelines are sensitive and not released to the public.
Noise at Work Good Practice Guide	Support implementation of Directive 2003/10/EC	European Commission DG EMPL.	Developed in consultation with social partners.	Support implementation of provisions of Directive 2003/10/EC	Aimed at companies and individuals concerned with preventing occupational risks.	Cited in Article 14 of Directive 2003/10.	Non binding good practice guide.	
Voluntary Commitment of the PVC industry- Vinyl 2010	Promote sustainable development in PVC production	Industry	Developed in consultation with European Commission		Industry	Industry voluntary initiative	Defines targets and implements a variety of projects.	

Best practice (title/issue)	**Objectives**	**Prepared by** • Government • Industry • Prof. Ass'n • Other	**Process of development:** • Consultation • Experts • Others	**Role of best practice in EU policy**	**Target group to use best practice:** • Government • Industry • Professionals • Consumers • Other	**Legal / institutional role of guidelines** • Cited in legislation? • Formal adherence? • Voluntary / mandatory?	**Type of guidelines:** • Standards • Technical rules • Code of practice	**Further notes** (e.g. extent of detail in BP; evaluation of results; other)
UK Voluntary Initiative (Pesticides)	Minimise environmental impacts of pesticides	Industry	Developed in consultation with national government (UK)	UK focus only	Farmers, growers, pesticide managers.	Industry voluntary initiative	Sets out a programme of measures to be followed.	
UK Responsible NanoCode	Establish good practices and provide guidance in area of nano-technologies	UK Royal Society; Insight investment and Nanotechnology Industries Association	Developed in consultation with companies, scientists, Member States, NGOs and labour organisations	UK focus	Companies manufacturing or retailing products using nano-technologies, universities, research laboratories.	Voluntary principles-based code of conduct.	Sets out principles for organisations to follow; benchmarking framework.	
Initiatives								
The Common Implementation Strategy: Guidance documents for the Water Framework Directive (WFD)	Supporting implementation of WFD	EU Institutions and National governments. (With active involvement of stakeholders, environmental NGOs and scientific community.)	Consultation between EU Institutions, national officials and stakeholders in working groups and expert groups. Development of non-binding guidance documents.	Supports the implementation of the WFD; contributions to revision of related legislation.	National governments. (i.e. competent authorities), regional and local governments, river basin authorities. Stakeholders and general public (e.g. guidance on public participation.)	Voluntary guidance documents	Technical and scientific description of the WFD.	
EU Network for the Implementation and Enforcement of Environmental Law (IMPEL)	Promote effective application of environmental legislation	EU Institutions		Supports application of environmental law	Local, regional or national competent authorities.	Cited in Article 3 of Decision No 1600/2002/EC of the European Parliament and of the Council.	Agency works on awareness raising, capacity building, exchange of information and experience, international enforcement collaboration.	
EU-OSHA	Promote health and safety at work.	EU institutions and National Governments			Aimed at governments, employers and workers.	Council Regulation (EC) No 2062/94 of 18 July 1994 establishing a European Agency for - Safety and Health at Work (as amended)	Agency promotes risk prevention, analysing new scientific research on workplace risks, identifying and sharing information and good practices.	

5.2 Options to promote best practices for sustainable use of biocides

Based on an analysis of the information gathered, including current actions to promote best practices at EU level as well as the activities reviewed in other sectors, the policy team identified a set of possible policy options that could be implemented at EU level to promote best practices for the sustainable of biocides. The options are set out below; Section 6 then presents initial cost estimates for each option.

These options are grouped into those that would not require changes to EU legislation (part A) and those that would require legislative changes (part B). Within each group, the options are arranged according to the main stages in the development and promotion of best practice documents; development, dissemination (including training) and monitoring/evaluation. Each option is presented separately; however, many are complementary and could be combined into a common "package".

The box below presents an overview of all the options.

A. Options to strengthen best practices (without legislative changes)

Developing best practice
1. EU-funded project to develop/improve best practice guidelines on biocides and their sustainable use
2. Use of EU-level procurement processes to develop specific best practice guidelines
3. Transfer of existing national best practices at a European level
4. Development of best practices by stakeholders through the standardisation process
5. Addressing biocides within the BREFs under the IPPC

Dissemination
6. EU public information campaign
7. EU-wide web site on the sustainable use of biocides
8. National web sites on best practices for the sustainable use of biocides
9. Help desks to provide information on best practices

Links to policy structure
10. Recommend inclusion of biocides in the National Action Plans for the sustainable use of pesticides
11. Create a working group under the Standing Committee on Biocidal Products to support sustainable use
12. Use information gathered during the biocidal product authorisation process to inform the development of best practices

B. Policy options that involve legislative changes

Dissemination
13. Training and certification

Monitoring
14. Reporting on the use of biocides

A. Options to strengthen best practices (without legislative changes)

Developing best practice

Option 1. EU-funded research to develop/improve best practice guidelines on biocides and their sustainable use

The EU has a number of programmes (e.g. FP7, European Cooperation in Science and Technology (COST)) that provide funding for targeted scientific research. These research funds could be made available to

encourage scientists, process engineers, eco-design specialists and other relevant experts to carry out the research and experimentation that may be required to fill specific gaps concerning best practices. For example, a gap that was identified in the consultation process was the lack of research relating to non-chemical alternatives to biocidal products. Further such research is likely to be needed to address newly identified hazards and novel products. For example, the UK HSE is updating its guidance on the use of PT13 (metalworking-fluids) to address the use of fluids that are designed to contain 'beneficial bacteria' to control the growth of other bacteria. The analysis of potential gaps in best practice documents (see Section 3.3) revealed that there are only a limited number of guidance documents for PTs 10, 11 and 12 (masonry preservatives, preservatives for liquid cooling and processing systems and slimicides). No guidance is available for consumers on PT10.

As the box below shows, the EU has already provided financing for research relevant to sustainable use of biocides through the FP6 and FP7 programmes.

Examples of FP 6 and 7 funded research projects relevant to best practices in sustainable use of biocides

FP6

- Continuous bactericide water filtration for the prevention of Legionella contamination in large public and industrial facilities (PT2, 11)
- High-reliability, non-chemical disinfestation system of fruits and vegetables (PT4)
- Health impacts of long-term exposure to disinfection by-products in drinking water (PT5)
- Holistic implementation of European thermal treated hard wood in the sector of construction industry and noise protection by sustainable, knowledge-based and value added products (PT8)
- Development of an affordable heat treatment process for wood (PT8)
- Advanced nanostructured surfaces for the control of biofouling (PT11)
- Diversity, molecular monitoring and genomics of Blattabacterium spp., the obligatory bacterial endosymbionts of cockroaches (PT18)
- Assessing impacts of TBT on multiple coastal uses (PT21)
- Environmentally friendly coatings for ship building and ships in operation (ECODOCK)(PT21)
- Non-toxic antifouling for leisure boats (PT21)
- Collective Research on Aquaculture Biofouling (CRAB) (PT21)
- Highly effective and low cost ozone compact electrochemical generator for environmentally friendly disinfecting (OCEGE) (Not covered by the current BPD; may be covered in forthcoming Regulation)
- Dramatically reducing spreading of invasive, non-native exotic species into new ecosystems through efficient and high volume capacity ballast water cleaning system (OCEANSAVER) (Not covered by the current BPD)

FP7

- Continuous Bactericide Water Filtration For The Prevention Of Legionella Contamination In Large Public And Industrial Facilities (LEGIOTEX)
- Smart release of biocides in finishing materials for the sector of construction (AXIOMA)
- Development and implementation of a contact biocide polymer for its application as antimicrobial and anti-deposit surfaces in the food industry (BIOSURF)
- Confronting the clinical relevance of biocide induced antibiotic resistance (BIOHYPO)

Antifouling

- Surface engineering for antifouling - Coordinated advanced training (SEACOAT)
- Hygienic and energy optimized conveyor belt for the slaughtering industry (HYCON)
- Nano-particles: their application in the development of electrochemical molecular beacon biosensors (NANOSENS)

Disinfection

- Advanced CO_2 cleaning as an ecological process technology (ACCEPT)
- A pilot line of antibacterial and antifungal medical textiles based on a sonochemical process (SONO)
- Security and decontamination of drinking water distribution systems following deliberate contamination (SECUREAU)
- Impact of climate change and globalisation on safety of fresh produce governing a supply chain of uncompromised food sovereignty (VEG-I-TRADE)
- Water detoxification using innovative vi-nanocatalysts (CLEAN WATER)
- Membrane distillation in remote areas (MEDIRAS)
- Integrated monitoring and control of foodborne viruses in European food supply chains (VITAL)

Preservation

- Development of an affordable heat treatment process for wood (TORCHWOOD)
- Sterilization of variety of materials, biomedical and food production equipment using low thermal atmospheric pressure plasma jet combined with advanced oxidation processes (PLASMA STERILIZATION)
- Processing Raw materials into Excellent and Sustainable End products while Remaining Fresh (PRESERF)
- Development of a cost-effective, durable coating system with low fungicide content for wood surfaces using plasma discharge (DURAWOOD)
- Damage risk assessment, economic impact and mitigation strategies for sustainable preservation of cultural heritage in the times of climate change (CLIMATE FOR CULTURE)
- Strategies for the protection of shipwrecks in the Baltic Sea against forthcoming attack by wood degrading marine borers. A synthesis and information project based on the effects of climatic change (WRECKPROTECT)
- Strategy for the preservation of plastic artefacts in museum collections (POPART)

One Member State official interviewed said that few of the current studies conducted under FP6 and FP7 directly relate to alternative methods, and urged greater attention to this area.

In order for the EU to receive maximum added value for the use of its funds for research, it will be important to identify where there is significant need for additional research. An important further step will then be to disseminate the results of this research, including on alternative, non-chemical methods: one mechanism could be to call for the publication of new best practice documents as an output of research projects.

Option 2. Use of EU-level procurement processes to develop specific best practice guidelines

This review has identified many examples of best practices for the use of biocides, and many of these touch on aspects of sustainable use. Nonetheless, some important gaps remain. As noted, few best practice documents focus on sustainable use. Moreover, the analysis in Section 3.4 suggests areas where best practice documents are relatively few compared to risk levels: for example, PTs 10, 11, 18 and 21. Under this option, the European Commission would sub-contract work to identify and further develop such best practice via an open tender.

In order for such documents to be accepted as best practice at EU level, it would need to be subjected to an EU-level review and approval process. For example, draft documents could be reviewed by Member States and stakeholders via a working group (see Option 11 below which proposes a working group such as this) and via an open comment period. The final versions would take on board comments received. They would not be published, however, as EU legal documents. Rather, they could be published on an EU web site for biocides (see Option 7), with the DG Environment biocides page only providing the link.

Option 3. Transfer of existing national best practices at a European level

The survey of existing best practice guidance documents indicated that some Member States have developed detailed guidance which has only been disseminated nationally or which have reached only a limited audience. This is also the case with certain best practice documents developed by industry stakeholders.

The reason for this is often the language in which such guidance is provided. For example, the best practice documents for metal-working fluids (PT13) or swimming water treatment (PT5) are available only in the German language. The European Commission could fund the translation of these documents into other national languages. It could also encourage the establishment of working groups for the harmonisation of existing guidance at a European level.

A further barrier to dissemination, as already identified in the Technical Specifications for this study, is that there appears to be little exchange of newly identified best practices among competent authorities and stakeholders. This can be linked to two different areas; first, the exchange of information among Member States and stakeholders (see Option 11) and second, the dissemination of documents (see Options 7, 8 and 9).

Option 4. Development of best practices by stakeholders through the standardisation process

One possibility for developing best practices at EU level would be to involve industry and professionals as well as Member State experts in a standardisation process, using as a starting point any existing national and industry standards. Under the New Approach,[41] the Commission and Member States could request the Comité Européen de Normalisation (CEN) to initiate such a process.

This work may start with a review of relevant standards at national level that could be used as a model for European standards; for example, the German DIN 68800 series on wood protection might be considered for PT8. An example that was identified during this study is the cooperation between the British Standards Institute (BSI) and the CEN for the development of harmonised standards on wood preservative biocidal products (PT8).

CEN standards are intended for industrial/professional use only. They are available only for a fee which is not considered as a serious obstacle for industrial/professional users. However, this option would not be appropriate for best practice documents for the public and consumers.

Option 5. Addressing biocides within the BREFs under the IPPC

The IPPC Directive identifies biocides among the pollutants to be taken into account in fixing emission limits during the process of preparing an integrated permit for one of the industrial processes covered in Annex I.[42] The Commission's proposed Directive on Industrial Emissions, which would replace the IPPC Directive, contains a similar mention of biocides as relevant for setting emission limits in integrated permits.[43]

Under this option, best practices for sustainable use of biocidal products would be brought into specific BREFs[44] as relevant, so that the BREF would contain the detailed technical information to enable industry

[41] Council Resolution on a New Approach to technical harmonisation and standards. OJ C 136, 4.6.1985, p.1.

[42] "Biocides and plant health products" are listed in Annex III ("Indicative list of the main polluting substances to be taken into account if they are relevant for fixing emission limit values") of Directive 2008/1/EC concerning integrated pollution prevention and control (codified version) as relevant for emissions to water.

[43] Proposal on industrial emissions Integrated Pollution and Prevention Control) COM (2007) 844.

[44] Permits required under the IPPC Directive, establishing a framework requiring Member States to issue operating permits for certain installations of industrial sectors laid down in Annex 1 of the Directive, must be based on Best Available Techniques (BAT) to achieve a high level of protection of the environment. Member States are required to

and permitting officials to agree on appropriate emission limits to set out in the integrated permit. Here, an important step would be to give greater attention in the BREFs to the occupational health aspects of pollution releases.

The review in this study of existing BREFs prepared under the IPPC Directive found references to biocides in several cases, but in general the information and provisions are brief. For example, the BREF on tanning has only a few passing references to biocides; it calls for the use of those biocidal products with the lowest toxicological and environmental impacts and at the lowest concentrations possible but provides few further details. In contrast, the BREF document on BAT for the paper and pulp industry addresses the use of PT12 biocides in some detail, as well as issues related to their emission to the environment.

The integrated permitting process is a very important opportunity to disseminate best practices in sustainable use of biocides and it is a gap of particular concern that so few BREFs cover biocidal use in detail. As the table below illustrates, biocidal products are used in industrial processes for the following sectors subject to the IPPC Directive's requirements. As Table 5.2 shows, a number of these BREFs have been in place for some time and there may be new best practices available for control of the microorganisms or other harmful organisms for which the biocidal PT is used.

Table 5.2: Overview of biocidal products used in industrial processes subject to IPPC.

Industrial sector	Date current BREF published	Status of revision	PT
Intensive Rearing of Poultry and Pigs	July 2003	-	3
Slaughterhouses and Animals By-products Industries	May 2005	2012	4
Food, Drink and Milk Industries	August 2006	-	4
Surface Treatment using Organic Solvents	August 2007	-	8, 21
Textiles Industry	July 2003	2011	9
Tanning of Hides and Skins	February 2003	-	9
Pulp and Paper Industry	December 2001	-	11
Industrial Cooling Systems	December 2001	2011	12
Emissions from Storage	July 2006	-	-

Work to address biocides would take place as BREFs are reviewed and revised over time. In particular, the role of biocidal products in each industrial process would be considered in more detail, in order to identify best available techniques (BAT) for reducing impacts on the environment at the point where the biocidal PT is used, e.g. through substitution, non-chemical means of control of harmful organisms or closed process systems.

The draft Directive on Industrial Emissions suggests including the preservation of wood with a production capacity above 75 m^3 per day. This would cover water based wood preservatives as well as those with organic solvents.[45]

Note that this approach may have some overlap with Option 3, insofar as regards biocide use in major industrial processes.

take into account BAT reference documents (BREFs) when determining their best available techniques. BREFs are produced by the European IPPC Bureau and are available on their web site: http://eippcb.jrc.es/index.html

[45] DEFRA in the UK carried out an impact assessment to the revised IPPC Directive. This document estimates that to date only 9% of all installations of the UK wood preservation industry use more than 25 tonnes of solvent per year and are thus covered by current Solvents Emissions Directive: the main reason is that most of the installations use water-based preservation agents. Under the revisions proposed in the new Industrial Emissions Directive, more than 50% (250 installations) of the industry in the UK would come under the scope of the IPPC Directive. See: DEFRA 2008. Phase 2 of the Impact Assessment of Proposals for a Revised IPPC Directive Part 7: Preservation of Wood and Wood Products Final report, London, June 2008 http://randd.defra.gov.uk/Document.aspx?Document=EP01014_7375_FRP.pdf

Dissemination

Option 6. EU public information campaign

The European Commission regularly runs public information campaigns on major issues. Recently campaigns have covered:

- Biodiversity protection
- Promotion of life-cycle costing and
- Air passenger rights.

Biocides and their sustainable use could be the topic of a campaign. The campaign might explain what biocides are, the types of consumer products where they can be found as well as how consumers might reduce the use of products that include biocides.

As a complement to the Commission's campaign, industry could be encouraged to finance information campaigns on specific PTs. Additionally, the Commission could encourage co-operation between industry and relevant non-governmental organisations or associations (public health, labour, and environment) on the issues arising under sustainable use of biocides. One possible example is the the Voluntary Initiative on responsible pesticide use in the UK: this forum brings together different stakeholders including industry and NGOs.[46]

In this case, it would be important to have a body responsible for coordination, to ensure that the different campaigns are complementary in terms of their approach and their messages (the working group proposed under Option 11 could provide such a forum).

Option 7. EU-wide web site on the sustainable use of biocides

A web site at EU level could build on the current study, by making available best practice guidelines that have been identified as the most useful for EU-wide dissemination. While the current study proposes an initial set of guidelines, a process will be needed to identify others that are developed in the future and to reach general agreement on the ones that would appear on the web site (this might be linked to the proposal for a working group under Option 11).

The web site could provide best practices for professional and industry use as well as information on biocides for the broad public, possibly including games and other public information methods developed by Member States or industry, and encourage the sustainable use of biocides.

Such a web site could potentially host public engagement materials like "Pesky Pests"[47] and "Pests on the Menu"[48] by the CIEH/NPAP or the web based quiz designed by CRRU. The launch of a web site could be part of an EU-wide campaign on biocides (Option 6).

The web site itself could be linked to the DG Environment web page on biocides, but be managed separately.

Option 8. National web sites on best practices for the sustainable use of biocides

The European Commission can also recommend that Member States set up national web sites on the sustainable use of biocides, highlighting best practices and other approaches for their sustainable use. Given the different national regulatory frameworks, industry structures and training availability, national web sites

[46] See http://www.voluntaryinitiative.org.uk/default.aspx
[47] See: http://multimedia.cieh.org/npapresources/peskypests/peskypests.htm.
[48] See: http://multimedia.cieh.org/npapresources/pestsonthemenu/pestsonthemenu.html.

could be the most appropriate level for practical guidance. The recently unveiled web site set up in Germany, www.biozid.info, may provide one model. Each web site would be in national language(s) and would be linked to other national web sites as well as an EU-wide site, if one is created (Option 7).

If this is the case, each Member State web site should as a minimum provide a "mirror" of the EU site. The use of national languages would make these sites accessible to the public and to many professionals as well, particularly those that are in SMEs or self employed. Moreover, national sites could be linked with national industry associations as well as training requirements (see Option 13 below).

Option 9. Help desks to provide information on best practices

A further mechanism could be to establish help desks on biocides. A help desk could provide more in-depth and focused information than a web site, reflecting the fact that biocides are used in a great variety of applications, by both the public and professionals, across different PTs and in different industries. A help desk could also refer queries to European or national bodies able to provide more detailed information, including bodies developing best practice guidelines

The help desk option could be at national or EU level. If at national level, the European Commission could recommend that each Member State set up national help desks to provide in-depth and more focused information than a web site, e.g., advice in terms of national regulatory frameworks, industry structures and training requirements.

A help desk at EU level could be valuable if a set of best practices are agreed at EU level (as under Options 2, 3 and 4).

Links to policy structure

Option 10. Include biocides in the National Action Plans for the sustainable use of pesticides

The European Commission could recommend that Member States include biocides in the National Action Plans (NAPs) currently being developed under the Sustainable Use Directive for pesticides.[49] Article 4 of that Directive requires Member States to

> *adopt NAPs setting quantitative objectives, targets, measures and timetables to reduce risks and impacts of pesticide use on human health and the environment and to encourage the development and introduction of integrated pest management and of alternative approaches or techniques in order to reduce dependency on the use of pesticides.*

While the Sustainable Use Directive's definition of pesticide includes both plant protection products and biocidal products, Article 2 on its scope specifies that the Directive's requirements apply to pesticides that are plant protection products. Therefore while Member States must consider plant production products in the development of their NAPs, they are not required to include biocidal products. However, the option is available to them. Indeed, several Member States have reportedly already done so, including Belgium, France and Sweden.[50]

The recommendation for Member State action could encourage the development and dissemination of best practices for sustainable use of biocides, though other policy actions for sustainable use may be also suggested. For example, Member States could select specific industries or biocidal PTs of concern and then set quantitative objectives, targets, measures and timetables to reduce risks and impacts from their use.

[49] Article 4 of Directive 2009/128/EC establishing a framework for Community action to achieve the sustainable use of pesticides, *OJ L 309, 24.11.2009, p. 71–86.*

[50] Andy Adams, *Proposals to encourage the sustainable use of biocides in Europe*, Presentation, March 2010

The recommendations could also refer to approaches taken in NAPs, including those for pesticides, such as the Voluntary Initiative that is part of the UK National Action Plan.[51]

Option 11. Create a working group under the existing Standing Committee on Biocidal Products to support sustainable use

A working group could act in several areas related to best practice on sustainable use. For example, it could provide a forum for reviews of new best practice guidelines at EU level, such as those developed under Option 2. It could also review plans related to the EU web site (Option 7), including proposals for best practice guidelines to be published on the web site. The working group might also discuss other options, beyond best practices, for promoting sustainable use and any links with the legislation.

The working group would operate under the Standing Committee on Biocidal Products.[52] The working group might include observers from industry and other stakeholders, such as NGOs. It would thus provide a forum for moving sustainable use forward at EU level.

Option 12. Use information gathered during the biocidal product authorisation process

As implementation of the EU legislation covering biocidal products proceeds, the approval of active substances for the Annex I positive list and the authorisation of biocidal products for specific uses generates a significant amount of data and information on the risks associated with active substances and biocidal products. During the review of dossiers by the Commission and Member States, this information could be used to identify areas where best practices are most needed or could be most effective and thereby inform the further development and dissemination of best practices. To do so, legal provisions may be needed for access to the information in the dossiers for use in the analysis of best practice needs.

For example, the Inclusion Directives for active substances into Annex I or IA of Directive 98/8/EC[53] describe specific provisions on different risk mitigation measures (RMM) which shall be considered during the authorisation of biocidal products. More specific RMM may be included in the authorisations of biocidal products. Examples of RMM are the definition of a user category (e.g. only professional or specialised professional user for certain biocides such as fumigants), the area of use (e.g. use classes of wood preservatives), the form of a product and its functional design (e.g. only ready for use products), the mode of application (e.g. insecticide application as gel bait instead of spraying, impregnation of wood via vacuum pressure instead of dipping). For biocidal products also operational conditions such as the duration and frequency of an application and the amount applied may be prescribed. Best practices for sustainable use of biocidal products could be linked to these provisions in a maner similar to guidance prepared by the UK Wood Protection Association (WPA). For example, the WPA guidance "Industrial Wood Preservation – Specification and Practice" integrates advice on meeting legal requirements with more extensive best practice guidance.[54] Product integrated RMM intended for the formulator or supplier of a biocidal product have a direct impact on (sustainable) use while those RMM that are intended for the user of a biocidal product (e.g. application area or directions of use) might be supported by guidance documents.

[51] http://www.voluntaryinitiative.org.uk/

[52] Such a working group would need to operate separately from the Expert group on the Thematic Strategy on the sustainable use of pesticides, for the reason that biocidal products cover so many product types and uses and therefore need to be considered in a context separate from plant protection products. However, the existing Committee on Toxicity, Ecotoxicity and the Environment (CSTEE) on risk reduction measures for plant protection products might serve as a useful model for such a working group, and regular communication between the two bodies would be valuable.

[53] Active substances that are approved for inclusion in biocidal products are listed in Annex I or IA to the Directive. The Inclusion Directive for each active substance contains the date of formal inclusion into Annex I or IA. The authorisation or mutual recognition must be applied by this date. A list of Inclusion Directives can be found on the website of DG ENV: http://ec.europa.eu/environment/biocides/annexi_and_ia.htm

[54] Available for a fee from the Wood Protection Association: http://www.wood-protection.org/.

Information could also be used in the opposite direction, as ideas from best practices could be considered in the authorisation of biocidal products. The best practices would be considered when specifying usage guidelines for biocidal products aimed at reducing risk to health and the environment.

B. Policy options that involve legislative changes

Dissemination

Option 13. Training and certification based on best practice documents

Several Member States already have requirements for training and certification of professional users for certain types of biocides. For example, training and certification of pest controllers (PTs 14, 18, 19) is often mandatory, e.g. in Belgium, Estonia, Germany, Hungary, Lithuania, Malta, The Netherlands, Romania, and Spain.[55]

For plant protection products, the Directive on Sustainable Use of Pesticides calls on Member States to ensure that all professional users, distributors and advisers have access to appropriate training and shall establish certificate systems providing evidence of attendance to training (Article 5).

A new provision in EU legislation could require training and certification for professional users of biocidal products in certain PT categories, and in particular that such training and certification refer to and include best practices for sustainable use. As the legal basis of the Biocides Regulation does not allow harmonisation of training requirements, a separate legal instrument would be needed.

Alternatively, the EU and Member States could encourage voluntary initiatives for training and certification.

Examples from the UK of recent voluntary initiatives include the new "Wildlife Aware" training course established by CRRU and BASIS[56] and the associated accreditation scheme for professional pest control technicians.[57] The objective of accreditation is to indicate to customers of rodent pest control services that accredited users work to the highest standards to achieve effective pest control with minimum adverse effects on wildlife and the wider environment. The accreditation is provided to the individuals, not to their companies.

Other examples of vocational training and qualifications are those provided by the British Pest Control Association (BPCA)[58] and CIEH/NPAP.[59] All of these provide nationally recognised qualifications. In addition, the Wood Protection Association (WPA) provides training and qualifications in relation to wood protection.[60] These are often provided via local/regional vocational training colleges.

Monitoring

Option 14. Reporting on the use of biocides

At present, there is a widely acknowledged gap in information concerning the actual use of biocides, due to the lack of data collection in this area. Although the review program for biocidal substances addresses risks

[55] Annex II of the 2009 COWI study on "Assessment of different options to address risks from the use phase of biocides" containing Competent Authorities' responses to a questionnaire on national measures on sustainable use of biocides describes examples for user restrictions and (mandatory or voluntary) certification of professional users.
[56] Web site of BASIS: http://www.basis-reg.co.uk/default.aspx
[57] http://www.thinkwildlife.org.uk/wildlife_aware.php
[58] http://www.bpca.org.uk
[59] http://www.cieh.org/training.html
[60] http://www.wood-protection.org/training.asp

from biocides, additional comprehensive data available to policy makers and stakeholders would lead to a better understanding of those areas where further reduction of risks to human health and the environment from the use of biocides can be achieved, and more generally where the best opportunities may lay for the promotion of sustainable use.

Thus gathering of data on biocides use through reporting, for example, can support actions for sustainable use, including the development and application of best practices. In this way, requirements for the provision of information can become a useful policy tool.

Article 57: Record-keeping and reporting

1. Producers, importers and professional users of biocidal products shall keep records of the biocidal products they produce, place on the market or use for at least three years. They shall make available the relevant information contained in these records to the competent authority on request.

2. The Commission shall adopt implementing measures to specify the form and content of the information in the records, and to ensure the uniform application of paragraph 1 in accordance with the procedure referred to in Article 72(3).

Article 57 of the proposed Biocides Regulation sets out record-keeping and reporting requirements for producers, importers and professional users. Once this Regulation is completed through the EU legislative process, the Commission will need to propose implementing measures along the lines of the Pesticides Statistics Regulation, specifying what information will be required and how it will be collected and compiled.

However, there are opportunities in other existing EU legislation where complementary or additional information could be gathered that would be useful to guide the development and promotion of best practices for sustainable use, and where provisions relevant to biocidal products could be introduced.

These include the following:

- ***Directive 2008/1/EC concerning integrated pollution prevention and control (and the proposed Directive on industrial emissions)***

As noted above (Option 5), Annex III to this Directive includes biocidal products in the "Indicative list of the main polluting substances to be taken into account if they are relevant for fixing emission limit values."

The proposed Directive on industrial emissions could require reporting by major industrial facilities of any biocidal product (and its active ingredient) released into water. At a minimum, the reporting should include the identity of any biocides used, the quantities, and data on exposure and release to the environment. Reporting requirements could be linked to the integration of biocides in the BREFs (Option 5).

- ***Regulation (EC) No 166/2006 concerning the establishment of a European Pollutant Release and Transfer Register (E-PRTR)***

If major industrial facilities were required to report on the identities and amounts of biocidal products released to water, this information could be included in the European Pollutant and Transfer Release Directive. This would become an important point of access to information for any stakeholder wishing to have a better understanding of the pollutants released to the environment in their localities and across Europe.

It would also provide a strong incentive for industrial facilities to undertake measures for reducing releases of the biocidal products to the environment and in the process would encourage the development of new best practices.

- ***Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work***

Provisions here could only refer to data on the use of biocides in workplaces. Enterprises using biocides would be required to report or have information available upon request by the competent authority.

Directive 98/24/EC provides several provisions on which basis relevant information is available:

- Determination and assessment of risk (Article 4)
- Availability of information on emergency arrangements involving hazardous chemical agents (Article 7(5))
- Health surveillance records (Article 10 (2 and 3).

Again, these suggestions would involve reporting to Member State authorities and thus review at EU level would require a further step in reporting as well as the compilation of the information.

- ***Directive 2000/60/EC establishing a framework for the Community action in the field of water policy***

Article 8 of the Water Framework Directive requires the monitoring of surface water status, groundwater status and protected areas. According to Artcile 15, Member States shall submit summary reports of the monitoring programmes designed under Article 8. The monitoring activities shall be in accordance with the requirements of Annex V, which set out the design for monitoring.

- ***Directive 2006/118/EC on the protection of groundwater against pollution and deterioration***

Similar to the Water Framework Directive, Directive 2006/118/EC underlines that reliable and comparable methods for groundwater monitoring are an important tool for assessment of groundwater quality as well as for choosing the most appropriate measures.

- ***Directive 98/83/EC on the quality of water intended for human consumption***

Article 5 of Directive 98/83/EC requires Member States to establish values applicable to water intended for human consumption for the parameters that are set out in Annex I to the Directive. Aricle 7 requires that Member States take all measures necessary to ensure that regular monitoring of the quality of water intended for human consumption is carried out, in order to check that the water available to consumers meets the requirements of this Directive and in particular the parametric values set in accordance with Article 5.

5.3 Combining options for possible synergies

The coordinated implementation of several options could lead to synergies that bring increased effectiveness and cost savings. Benefits that arise from one option can provide inputs to other options, so that the combination of options leads to additional results. The following examples focus on the areas of the development of best practice, the dissemination of best practice documents and the links between best practice and the regulatory structure.

- ***Data collection and research to support the development of EU best practice documents (Options 1, 5, 12, 14, and 11)***

  EU-funded research programmes such as FP7 support targeted scientific research. Data and information generated as part of the authorisation process regarding the risks associated with biocidal products can identify areas where new research is needed. This "package" can then use research

results for the development of new best practice documents. In addition, research results and best practices can be brought into specific BREFs. Any gaps that follow from this process could provide entry points for further research. A working group under the Standing Committee on Biocidal Products would provide a mechanism for review of results and draft best practice documents.

- ***Coordinated dissemination of best practices (Options 7, 8, 9 and 11)***

  In this "package" of options, an EU-wide public information campaign could be run following the establishment of helpdesk(s) and the launch of web site(s). These combined activities will increase visibility as well as feedback from target groups. A working group under the Standing Committee on Biocidal Products would provide support to the activities as well as coordination between EU and Member State activities.

- ***Strengthening the regulatory structure for sustainable use (Options 10, 11, 13 and 14)***

  This package brings together several options that promote the sustainable use of biocidal products through policy mechanisms. One is the recommendation to include biocides in the National Action Plans (Option 10). Here, requirements on training and certification standards for professional users in certain PT categories can be introduced (Option 13 on training and certification as well as Option 14 would require legislative changes). New reporting requirements would also be included.

  This package is expected to be mutually reinforcing. For example, as Member States include objectives and/or targets on the sustainable use of biocidal products in their NAPs, monitoring and reporting processes such as indicators can strengthen implementation.

  A working group under the Standing Committee on Biocidal Products could provide a platform for Member States to exchange information on the approaches to the sustainable use of biocides in their NAPs.

We propose to further develop these and possibly other "packages" of options in the final version of this report.

6 Preliminary estimates of costs for developing best practice at EU level

This section provides an initial assessment of the costs to principle stakeholders of the options identified in Section 5. It also provides an overview of the potential benefits. In many instances it has been possible to quantify the costs of options; however, this has rarely possible for the benefits. This is because the benefits are primarily indirect; the options will assist in the development and dissemination of best practice in the use of biocides which, in turn, should help to promote a more sustainable use.

6.1 Costs of options

A. Options to strengthen best practice (without legislative changes)

Developing best practice

Option 1: EU-funded research on biocides and sustainable use to inform best practice guidelines

The cost of commissioning a research study will clearly depend upon the scope of the project. An indication of the potential cost can be provided by the costs of previous biocide-related research studies part funded by the EU; these are shown in Table 6.1. The nine research projects identified required between three and four years to complete, not including the time needed to draw up the project specifications and for the tendering process.

Table 6.1: Costs and duration of previous biocides research projects

	Costs (€ 000)		
	Max	Min	Average
Total cost per project	3,720	1,450	2,038
Percentage of funding provided by FP7	67%	97%	86%
Project duration (months)	48	36	42
Total project cost per year	**930**	**483**	**582**

The annual costs per project range between €0.9 million and €0.5 million, with an average of €0.6 million. The percentage of the total project cost met by FP7 funding ranges between 67% and 97%, with and average of 86%. Approximately 1% of the total cost of the projects related to gathering together suitable experts and forming them into teams. This team formation work was funded by the intergovernmental framework for European Cooperation in Science and Technology (COST), separately from the costs shown above.

The total cost of Option 1 would depend upon the number of projects supported. The option could largely be funded through existing EU programmes; as such, it would not require an additional budget but, of course, it would employ funds that would otherwise be used in other fields.

Option 2: Use of EU-level procurement processes to develop specific best practice guidelines

The costs of developing best practice guidelines at EU level would depend upon the number of guidance documents required, the way in which guidance is developed and whether it requires translation.

Stakeholders reported a wide range of time and costs for developing best practice guidance documents (see Section 4.6). The estimated staff time required ranged from 40 days for a short document in the UK to 300 days for a detailed best practice technical standard in Germany. Estimated costs for production ranged from €22,000 to over €2 million. Longer documents will take longer to prepare, and those covering the whole EU may be more complex. However, we have suggested that the guidance should be available online only, so that no significant publication costs will be incurred.

To take account of the variability in estimates, we have assumed a range of two months to six months of personnel time to develop best practice guidelines at EU level. We have assumed that the guidance will be developed by consultants under contract to the Commission and thus the costs will be similar to average fee rates for senior, support and other staff in current Commission framework contracts. In addition, there will also be a requirement for Commission staff time to oversee the process; we have assumed that this will be covered by existing Commission budgets.

Guidance provided at EU level may require translation; the costs of this have been calculated using the fee rates published in the EC list of Technical Translation Contractors (21 September 2009). The length of the document to be translated will affect the translations costs; therefore the sizes of the guidance documents identified by this study (100 to 200 pages) have been used to provide indicative maximum and minimum sizes of future documents.

The estimated costs for the development of a single guideline at EU level are shown in Table 6.2.

Table 6.2: Estimated costs for the development of EU guidance for one product type

Cost type	Costs		
	Max	Min	Average
Cost (person months)	6	2	4
Staff Costs (€/ month)	21,750	21,750	21,750
Total cost (€, one language only)	**130,500**	**43,500**	**87,000**
Translation (EURO /page)	57	9	33
Pages per document (from guidance documents identified by this study)	200	5	100
Translation cost per document per language (Euro)	11,400	45	3,300
Total cost per document (EN,FR and DE only) (Euro)	**176,100**	**43,680**	**100,200**
Total cost per document (23 EU working languages) (Euro)	**392,700**	**44,535**	**162,900**

The total costs would vary depending on how many EU-level guidance documents are produced. Based on the analysis in Table 3.4, it could be assumed that four documents would be required to fill the gaps in best practice for PTs posing a greater than moderate risk. This would imply **total costs for Option 2 of €174,000 to €1.6 million**, depending on the extent of translation required.

Option 3: Transfer of existing national best practices on a European level

The costs of this option to the Commission would comprise the costs of translating existing best practice guidance into additional EU languages, together with potential funding of the travel and related costs of participants in working groups for the harmonisation of existing guidance at a European level. There would also be time costs for participants in working groups. Costs for the working groups would depend on the degree of alteration needed to ensure that guidance is appropriate for use across the EU. However, the costs are not expected to be substantial.

The estimated costs for translation of a single existing guidance document at EU level are shown in Table 6.3.

Table 6.3: Estimated costs for the translation of a national guidance document into other EU languages

Cost type	Costs		
	Max	Min	Average
Translation cost (€ /page)	57	9	33
Number of pages per document (based on the length of guidance documents identified by this study)	200	5	100
Translation cost per document per language (€)	11,400	45	3,300
Total cost per document (EN,FR and DE only) (€)	**176,100**	**43,680**	**100,200**
Total cost per document (23 EU working languages) (€)	**392,700**	**44,535**	**162,900**

The table indicates that this option could incur costs to the Commission of €45,000 to nearly €400,000 per document translated, depending on the length of the document and the number of languages into which it is translated.

The total cost would depend upon the number of documents to be translated. Table 3.4 identified a total of 299 potential best practice documents, but there is considerable variation in the scope of these and it is unlikely that all would be transferred to the EU level. On the other hand, it is possible that more than one document per PT might be required, to cover the range of use types within each PT. Assuming that 25 to 50 documents would be required, **the total costs for Option 3 could be in the range of €1.1 million to €19.6 million.**

Option 4: Development of best practices by stakeholders through the standardisation process

A BSI working group member indicated that the BSI contribution to the production of a set of four related standards, for the use of one product type in industry, was approximately £250,000 (around €300,000) over six years. The respondent indicated that a maximum of five other standards bodies had a similar level of involvement, a similar number had a moderate level of input (assumed to be 50% of maximum, or the equivalent of €150,000) and the rest "a lot less" input (assumed to be 10% of maximum, or equivalent to €30,000).

Based on this information, the possible costs of developing individual items of best practice guidance through the standardisation process are shown in Table 6.4. The development of guidance through the standardisation process is expected to take several years to complete.

Table 6.4: Costs of producing best practice guidance through the standardisation network

	Major contributors	Moderate contributors	Minor contributors	Total
Cost per country (€)	300,000	150,000	30,000	
Number of countries	6	6	15	27
Total cost per guidance item (€)	1,800,000	900,000	450,000	**3,150,000**

The total cost of developing one guidance item through the standardisation process is estimated to be €3.15 million. As with EU-wide guidance items, the total cost would depend on the number of guidance items produced. However, the costs of producing standards are generally recouped by standards organisations through the sale of standards. There would therefore be **no net costs to the Commission, simply the costs to users of purchasing standards**.

Option 5: Addressing biocides within the BREFs under IPPC

We have assumed that biocides will be addressed during the normal revision of a BREF; this should not add significantly to the costs of each BREF review.

However, as a worst case, it could be assumed that a separate review and revision of each relevant BREF would be carried out to include biocides and that this would cost the same as a planned review/revision. To identify the costs of reviewing/revising each BREF, we have divided the net annual cost of the IPPC Bureau by the number of BREF revisions carried out each year. The costings are based on the most recent information published by the Joint Research Centre (http://eippcb.jrc.es/reference/ and http://eippcb.jrc.es/about) and are shown in Table 6.5.

Table 6.5: Costs of separate BREF revision to address biocides

	Costs		
	Max	Min	Average
IPPC Bureau: number of staff (2007)	-	-	20
IPPC Bureau: budget (€ 000/year (2007))	-	-	15,000
IPPC Bureau: revenue (€ 000/year (2007))	-	-	5,000
IPPC Bureau: net cost (€ 000/year (2007))	-	-	10,000
Number of BREFs	-	-	33
Number of BREFs reviews started per year	4	2	3
Duration of BREF revision (years)	3	2	2.5
Approximate number of revisions ongoing each year	12	4	8
Estimated cost of revision per BREF (€ 000)	**2,500**	**833**	**1,333**

Table 6.5 indicates that the potential cost of a separate revision of a BREF to include biocides use could range between €833,000 and €2.5 million. If a separate revision was required for each of the nine BREFs identified in Table 5.2 (Section 5), this would total €7.5 million to €22.5 million. This is likely to be an over-estimate of the costs, however, as the work required to integrate biocides use into a BREF is unlikely to be the same as for a full BREF revision.

Dissemination

Option 6: EU public information campaign

The costs associated with running an EU-wide information campaign would depend upon a range of factors, including the length of the campaign, the number of EU countries to be covered, the amount and complexity of materials to be produced (e.g. printed materials would cost more than downloadable electronic materials, multimedia or video materials would cost more still). To understand the possible costs, we looked at the costs of three recent Commission information campaigns (on biodiversity, on promotion of life-cycle costing and on passenger rights).

Assuming that the biocides information campaign would cover the EU27, would last approximately seven months and would be organised by consultants following an open tender process, we estimate that the costs to the Commission would be between **€1 million and €2.3 million** (based on the cost of previous such campaigns funded by the Commission).[61]

To assess the costs to industry of supporting information campaigns on specific PTs directed at professional users, we have drawn on the example of the Amenity Group, which implements amenity aspects of the UK National Action Plan for the sustainable use of pesticides. This is because the amenity use of plant protection

[61] For example, Specifications to Invitation to Tender ENV.A.1/SER/2009/0048 European communication and outreach campaign on biodiversity: development and implementation of media plan; Contract award notice development of a promotion campaign for Life-Cycle Costing (LCC) in construction 2008/S 213-282608 (http://ted.europa.eu/udl?uri=TED:NOTICE:282608-2008:TEXT:EN:HTML).

products is in many ways similar to the professional use of biocidal products and supporting information campaigns on specific PTs might follow a similar model and thus incur similar costs. Table 6.6 sets out illustrative cost estimates for an information campaign, based on the costs of the Amenity Group (see also Option 10), adjusted to take account of the fact that the UK is a relatively high-cost Member State.

Table 6.6: Possible costs to industry of supportive information campaign

	Costs (€ 000)		
	Max	Min	Average
Cost of supportive information campaign in the UK	323	69	178
Average cost of supportive campaigns per Member State	184	39	101
Cost of supportive campaign across EU 27	4968	156	404

The total cost of this option, including both an EU-wide campaign and a supporting campaign in each Member State, would therefore be **between €1.2 million and €7.3 million**.

Option 7: EU-wide web site on the sustainable use of biocides

We have assumed that the set-up and maintenance costs for a single language web site on the sustainable use of biocides would be equivalent to the costs of setting up a national web site (see Option 8). The set-up costs are estimated to be approximately €1 million over three years, with further maintenance costs of approximately €130,000 annually.

The web site upon which the figures quoted above are based is http://www.biozid.info/. This web site has approximately 50 pages, each equivalent to one and a half A4 pages of text, plus a 30 word glossary containing approximately three A4 pages of text. Therefore, using the average translation costs per A4 page detailed for Option 2, the set-up costs of having parallel pages in more than one language are set out in Table 6.7.

Table 6.7: Additional costs of parallel web pages in more than one language

	Costs
Number of A4 text pages equivalent requiring translation	78
Translation cost (€ /page)	33
Translation cost per language (€)	2,574
Total cost (EN,FR and DE only) (€)	7,722
Total cost (23 EU working languages) (€)	59,202

The initial translation costs are relatively small, compared to the set-up costs for the web site. Additional translation costs would be incurred whenever the content of a page was changed; these are again likely to be relatively small. However, there would be additional set-up and maintenance cost implications with the addition of parallel web sites in additional languages. The total cost therefore for the setting-up of a three language web site could therefore be greater than the costs shown above.

Option 8: National web sites on best practices for the sustainable use of biocides

One of the case studies undertaken as part of this study provided information on the time in person-months required to set-up and maintain a national web site providing guidance on the use of biocides and especially their alternatives. These time requirements were converted to a monetary cost by using the average of the three fee rates for those undertaking work for the Commission under framework contracts, as set out in Table 6.2. The costs are shown in Table 6.8.

Table 6.8: Costs of setting up and maintaining a national web site on best practices

	Costs		
	Max	Min	Average
Set-up costs			
Staff costs (based on COM framework contract fees for 2010) (€/month)	N/A	N/A	21,750
Prototype set-up time (number of person-months over 1 year)	16	12	14
Prototype set-up costs (€ internal over 1 year)	348,000	261,000	304,500
Prototype set-up costs (€ external over 1 year)	68,000	68,000	68,000
Total prototype set-up costs (€ over 1 year)	416,000	329,000	372,500
Building-up phase (€ internal per year over 2 years)	348,000	261,000	304,500
Building-up phase (€ external per year over 2 years)	41,000	77,000	59,000
Total set-up (€ over 3 years)	**1,194,000**	**1,005,000**	**1,099,500**
Total set-up (€ per year over 3 years)	**805,000**	**667,000**	**736,000**
Maintenance costs			
Maintenance internal (person-months per year)	6	6	6
Maintenance internal (€ per year)	**130,500**	**130,500**	**130,500**

The set-up cost per Member State is therefore estimated at between €1 million and €1.2 million over three years, with annual maintenance costs of around €130,000 per year. If all twenty seven Member States have web sites then the costs would total approximately €27 million to €32.4 million for set-up and approximately €3.5 million per year for maintenance.

The above estimates are for the provision of comprehensive Member State-specific web sites. However, this option includes the possibility that some Member States may choose to do little more than translate the information provided by an EU-wide web site (Option 7); the costs of this are estimated to be approximately €2,500 for translation (see Option 7) plus web site set-up fees. The set-up of a national translated version of the EU site is likely to be simpler and would cost less than the set-up costs shown in Table 6.8. Assuming that setting up a translated site would take three months rather than three years, the cost would be around 8% of the minimum cost shown in Table 6.8, i.e. approximately €66,000. On the same basis, maintenance costs of approximately €10,000 per year would be incurred. If all Member States adopted this approach, the total cost would be around €1.8 million.

Further cost savings may be achieved if several Member States jointly commissioned translated web sites, sharing the costs between them. The setting up of such web sites is likely to be less labour intensive and costly and so the cost provided above may be considered to represent maximum estimates.

The costings set out above relate to the provision of a web site in one language only. However, several Member States have more than one official language, for example Belgium has three official languages. The provision of national web sites in additional languages would increase the costs significantly. There may be further costs incurred where the legislative framework or political structure differs between different regions within a Member State, for example for the UK it may be necessary to provide separate web sites, or separate pages within a single web site, for the England, Wales, Scotland and Northern Ireland.

Option 9: Helpdesks to provide information on best practices

Published EU contract award notices for the setting-up and running of national helpdesks[62] indicate the potential costs for such a service would be between €0.4 million and €0.8 million per year per Member State. If all 27 Member States set up national help desks, the cost could total €10.8 million to €21.6 million per year.

[62] For example, Contract Notice: PL-Warsaw: helpdesk and support services 2009/S 158-229752 (http://ted.europa.eu/udl?uri=TED:NOTICE:229752-2009:TEXT:EN:HTML).

This compares with costs for EU-wide helpdesks,[63] of between €0.5 million and €0.8 million per year. However, it is not clear how far these costs allow for assistance to be given in all the EU languages.

Links to policy structure

Option 10: Include biocides in the NAPs for the sustainable use of pesticides

Including biocides in the NAPs would incur costs both for Member State authorities, in preparing and running the NAP, and for users of biocides in taking the actions required. The latter costs would depend upon the types of actions to address biocides that are included within the framework of the NAP. If only limited action is required, the costs would be relatively low. However, if Member States chose to set objectives, targets and measures for specific PTs, or to develop voluntary initiatives for biocides users, the costs could be significant. The costs to users cannot therefore be assessed at this stage.

The amenity use of plant protection products is in many ways similar to the professional use of biocidal products (see Option 5). The costs of preparing NAPs to address amenity use of pesticides could therefore provide an indication of the costs of preparing and running a NAP to address professional use of biocides. The Amenity Group is responsible for addressing the use of pesticides by amenity users as part of the UK Voluntary Initiative; this includes all professional/industrial use of plant protection products other than for agriculture or forestry applications. Based on the published budget for the Amenity Group, Table 6.9 sets out the potential costs to Member State Authorities of addressing professional use of biocides within an NAP.

Table 6.9: Potential costs to Member State authorities of addressing professional use of biocides within a NAP

	Costs (€ 000 per year)		
	Max	Min	Average
Costs excluding management	321	55	173
Management costs	14.3	1.4	5.0
Total	**335**	**57**	**178**

Table 6.9 indicates that the annual cost ranges from €57,000 per year to €335,000 per year for a single (relatively high-cost) country. This compares to total costs for preparing and running the voluntary initiative of €4 million to €20 million per year, so that addressing amenity use comprises only around 1.5% of the total cost. These costs would be in addition to any costs to biocide users of actions undertaken under such a NAP.

Option 11: Create a working group under the existing Standing Committee on Biocidal Products to support sustainable use

The costs of this option would be limited, particularly if the working group met at the same time and in the same place as the Standing Committee. The only costs are likely to be reimbursement of the expenses of working group members for travel to additional meetings.

Option 12: Use information gathered during the biocidal product authorisation process

Depending upon how it is implemented in practice, this option may impose few, if any, additional costs. For example, reviewing the data could be part of the research to be funded under Option 1, the development of

[63] Operation of an EU helpdesk for the support and promotion of the Green Public Procurement (GPP), Eco-Management and Audit Scheme (EMAS), EU Ecolabel and Environmental Compliance Assistance Programme for SMEs (ECAP) initiatives 2009/S 99-142911 (http://ted.europa.eu/udl?uri=TED:NOTICE:142911-2009:TEXT:EN:HTML)

best practice guidance under Option 2, or the BREF reviews under Option 4. It could also be carried out by the working group envisaged in Option 11.

Similarly, consideration of best practice information in the authorisation of biocidal products should be carried out as part of the normal authorisation process and should not therefore incur additional costs. Staff responsible for authorisation could simply consult the relevant best practice guidance, for example via the web site envisaged under Option 7.

B. Policy options that involve legislative changes

Dissemination

Option 13: Training and certification

The impact assessment of the Thematic Strategy on the use of Pesticides[64] estimated that the costs to farmers, retailers and other trainees across the EU of mandatory training and certification would be around €250 million. There would also be costs to Member State authorities in developing and controlling the quality of training.

The cost of training professional biocides users in certain PT categories is likely to be significantly lower than €250 million, as fewer users are involved than in pesticides application. However, the use patterns and range of users for biocides vary to a much greater extent than for pesticides, which would partly offset the savings in costs. .

In Member States where training is already compulsory for professional users of some biocides, costs would be limited to any changes in training and certification regimes to meet EU requirements. Encouraging voluntary initiatives for training and certification is likely to have lower costs than a mandatory approach.

Monitoring

Option 14: Reporting on the use of biocides

The costs of this option would depend upon what data is to be reported and how reporting will take place. If reporting can take place through a variation to existing reporting requirements, for example under the IPPC Directive, the costs may not be significant. However, the development of a new and separate reporting mechanism could incur more substantial costs.

The impact assessment of the Thematic Strategy on the use of Pesticides[65] estimated that the costs of detailed annual data collection on pesticides use could be up to €14 million per year for authorities and users. The costs could be reduced by making reporting less frequent or less detailed. Even though the volumes of biocides used are much lower, the use patterns and range of users for biocides would make data collection much more complicated. Therefore, there is great uncertainty over the applicability of the €14 million estimate to biocidal products.

Summary of option costs

The estimated costs associated with each of the options are summarised in Table 6.10.

[64] European Commission (2006): The Impact Assessment of the Thematic Strategy on Pesticides. Commission Staff Working Paper SEC(2006) 894.

[65] European Commission (2006): *The Impact Assessment of the Thematic Strategy on Pesticides*. Commission Staff Working Paper SEC(2006) 894.

Table 6.10: Estimated costs associated with each option

Options	Costs
Options to strengthen the development of best practice (without legislative changes)	
Option 1: EU-funded background research (per project per year)	No additional cost (funded through existing programmes
Option 2: EU-level procurement process to develop guidelines	€0.2 to €1.6 million (depending on number of documents and languages)
Option 3: National best practice transferred to EU-level	€1.1 million to €19.6 million (depending on number of documents and languages)
Option 4: Best practice developed by stakeholders through standardisation process	No net cost; recouped through sale of standards
Option 5: Addressing biocides within the BREFs under IPPC	€0 to €22.5 million (depending on whether carried out as part of normal revision or through separate revisions)
Dissemination	
Option 6: EU public information campaign	€1.2 million to €7.3 million (including industry supporting campaign)
Option 7: EU-wide web site	€1 million plus €0.1 per year for maintenance
Option 8: National web site	€1.8 million to €32.4 million plus €0.3 to €3.5 million per year for maintenance (depending on degree of separate national content)
Option 9: Helpdesks to provide information on best practices	€0.5 to €0.8 per year (EU wide helpdesk) €10.8 to €21.6 per year (27 national helpdesks)
Links to policy structure	
Option 10: Include biocides in the NAPs for the sustainable use of pesticides	Below €0.3 million per year to authorities Costs to users cannot be quantified
Option 11: Create a working group to support sustainable use	Re-imbursement of expenses, only
Option 12: Use information gathered during the biocidal product authorisation process	No additional cost – can be carried out within other options
Policy options that involve legislative changes: Dissemination	
Option 13: Training and certification	Costs cannot be quantified
Policy options that involve legislative changes: Monitoring	
Option 14: Reporting on the use of biocides	Costs cannot be quantified

6.2 Overview of potential benefits

The potential benefits of best practices in the sustainable use of biocides are primarily indirect; the options will assist in the development and dissemination of best practice in the use of biocides which, in turn, should help to promote a more sustainable use. As discussed in Sections 2 and 4.2, stakeholders have indicated that the objectives of developing best practice guidance include:

- Protection of human health by the effective use of biocides to prevent disease
- Reduction of risks to human health and the environment from the potential adverse effects of (misuse of) biocides themselves
- Stronger implementation of EU and national requirements, potentially reducing enforcement and compliance costs
- Reduction of costs to users of biocides, users of products treated with biocides and regulators.

No quantitative information was provided by stakeholders on the impacts of best practice in meeting these objectives. As noted in Section 4.5, few organisations have monitored the impacts of best practice guidance in terms of behavioural change, none of the respondents were able to provide quantitative estimates of risk

reduction due to their best practice guidelines and none could provide estimates of cost savings from following best practice.

We also reviewed a number of studies on the impacts of the Thematic Strategy on the use of Pesticides, in particular the European Parliament paper on the benefits for human health of strict cut-off criteria and the BiPro Study on economic impacts.[66] However, these focus on plant protection products and therefore the results are not directly applicable or easily transferable to biocides in a robust way, because of the very significant differences in both quantities used and use patterns (which are much more variable for biocides).

The European Parliament study focuses on benefits in terms of a reduction in the adverse health effects of using pesticides through regulatory control. A similar approach could only be applied to biocides if data was available on the remaining health effects arising from biocides use despite the implementation of the Biocides Directive. This was not the subject of our study, but was considered in the COWI study on options to address risks from the use phase of biocides.[67] This study concluded that "...the lack of quantitative data on exposure (tonnages at EU and Member State level, monitoring data on emissions and occurrence in the environment etc.) as well as on hazard properties (toxicities and ecotoxicities) of the substances prevent a quantitative assessment of the overall risks [from the combined exposure to a variety of substances from the use of different types/categories of biocidal products]". Similarly, the Commission Impact Assessment on Regulation of the European Parliament and of the Council concerning the placing on the market and use of biocidal products[68] concluded that "implementation of the Directive is too recent for evidence to be available on impacts on pest control and on the level of human/animal health and environmental protection." Thus a key step in the cause-effect linkage between guidance on sustainable use of biocides and quantification of the subsequent benefits is missing.

The BiPro study identifies benefits in the form of cost savings to users from reductions in the quantity of pesticides used. The information gathered from stakeholders for this study did not provide a basis for linking reductions in use quantitatively to the implementation of best practice. Moreover, the cost savings to users are offset by the loss of sales to suppliers, so this is a transfer of costs rather than an overall reduction or benefit.

There is evidence, however, that there could be potentially significant benefits from the implementation of best practice on the sustainable use of biocidal products. The Commission Impact Assessment on Regulation of the European Parliament and of the Council concerning the placing on the market and use of biocidal products[69] concluded that "some stakeholders fear that a reduced variety of active substances may lead to future treatment gaps and the development of tolerance and resistance of target organisms." Such resistance could give rise to significant economic and social costs in future, from increased damage by target organisms and the need to use larger amounts of biocides to achieve adequate control. There are also concerns that, misuse of biocides could induce resistance of the active substance to target organisms. The Scientific Committee on Emerging and Newly Identified Health Risks recently discussed the potential impact of biocide use on antibiotic resistance. The study concluded that some resistance mechanisms are common to both biocides and antibiotics.[70]

---

[66] European Parliament (15 September 2008). Policy Department, Economic and Scientific Policy: The benefits of strict cut-off criteria on human health in relation to the proposal for a Regulation concerning plant protection products; BiPro (2004) Assessing economic impacts of the specific measures to be part of the thematic strategy on the sustainable use of pesticides.

[67] COWI (2009). Assessment of different options to address risks from the use phase of biocides.

[68] European Commission (2009). Commission Staff Working Document Accompanying document to the Proposal for a Regulation of the European Parliament and of the Council concerning the placing on the market and use of biocidal products. Impact Assessment {COM(2009)267} {SEC(2009)774}

[69] European Commission (2009). Commission Staff Working Document Accompanying document to the Proposal for a Regulation of the European Parliament and of the Council concerning the placing on the market and use of biocidal products. Impact Assessment {COM(2009)267} {SEC(2009)774}.

[70] SCENIHR. 2009. Assessment of the Antibiotic Resistance Effects of Biocides. Scientific Committee on Emerging and Newly Identified Health Risks, 19 January 2009 . http://ec.europa.eu/health/ph_risk/committees/04_scenihr/docs/scenihr_o_021.pdf

Best practices, for example in the form of integrated management approaches, could help to address these concerns. Avoidance of resistance to active ingredients can be addressed by adoption of best practices such as resistance management strategies (change of the active substance used, combination products with more than one active substance, integrated pest management). No quantitative data on the benefits of resistance control by biocides or the impact of misuse of biocides on resistance development are available. Some case studies exist, though, where cost and efficiency of integrated management approaches are compared to conventional treatment (see the box below).

Benefits of integrated pest management approaches

Miller et al. (2004)[71] analysed the effectiveness of integrated pest management (IPM) for the control of German cockroach (Blattella germanica) in a public housing environment. The "traditional" treatment consisted of monthly baseboard, crack and crevice treatment with a conventional biocide by using spray and dust formulation insecticides. The IPM treatment involved initial vacuuming of apartments followed by monthly or quarterly applications of baits and insect growth regulator devices. At the beginning of the study, the cost of the IPM treatment was significantly higher than the traditional treatment, but after four months the cost was comparable, because many of the IPM apartments could be moved to a quarterly treatment schedule. In addition, the IPM treatment was also more effective than the conventional treatment, as shown by monitoring of the remaining cockroach population by trapping.

Wang et al (2005)[72] conducted a comparative study on the cost and effectiveness of a building-wide cockroach IPM programme compared with bait alone treatment in public housing. In the IPM group, cockroaches were flushed and vacuumed and sticky traps were placed to monitor and reduce cockroach numbers. Educational materials were delivered to the residents; and only afterwards were bait gels applied to kill cockroaches. IPM resulted in significantly greater trap catch reduction than the bait alone treatment and was a more sustainable method of population reduction. The cumulative cost of IPM was significantly higher than that of the bait treatment at the beginning, but declined to the same level as the bait alone strategy after 29 weeks. The authors concluded that IPM will provide better control at a similar cost to bait alone treatment.

Although the options outlined in Section 5 have significant potential benefits, through contributing to the implementation of best practices in the sustainable use of biocides, it is difficult to allocate these benefits to individual options. This is due to lack of information on the extent of changes likely to arise from each individual option and the fact that the options will interact with each other. However, Table 6.11 summarises the types of direct benefits that each option may provide.

Table 6.11: Potential benefits associated with each option

Options	Benefits
Options to strengthen the development of best practice (without legislative changes)	
Option 1: EU-funded background research (per project per year)	• Increased knowledge of the impacts of biocides on target organisms, the environment and human health • A basis to prioritise any further action • Provision of the knowledge required to improve best practice on sustainable use of biocides use.
Option 2: EU-level procurement process to develop guidelines	• Increased availability of best practice • Standardisation and harmonisation of best practice across EU.

[71] Miller, D. M, Meek, F. 2004. Cost and efficacy comparison of integrated pest management strategies with monthly spray insecticide applications for German cockroach (Dictyoptera: Blattellidae) control in public housing. *J Econ Entomol.* 97(2):p.559-569.

[72] WANG, C., Bennett, G., 2005. Comparative Study of Integrated Pest Management and Baiting for German Cockroach Management in Public Housing. Journal of economic entomology Vol. 99 (3), p. 870-885. See http://www.beyondpesticides.org/documents/IPMstudyPurdue.pdf.

Options	Benefits
Option 3: National best practice transferred to EU-level	• Making existing best practice guidance more widely available, by translating it into a range of EU languages • Encouraging harmonisation of best practice across EU.
Option 4: Best practice developed by stakeholders through standardisation process	• Wider availability of best practice guidance, via the communication networks of CEN and national standards authorities • Standardised best practice across EU.
Option 5: Addressing biocides within the BREFs under IPPC	• Integration of biocides best practice into EU wide guidance for major industrial operations (i.e. all relevant guidance in one place) • Enhanced focus on best practice use of biocides by enforcement authorities • Standardised best practice across EU.
Dissemination	
Option 6: EU public information campaign	• Greater public and industry awareness of biocides and the issues (human and environment health, safety and sustainability) that surround their use • Greater stakeholder awareness of best practice guidance • Greater stakeholder awareness of how to obtain best practice guidance • Provision of information/educational tools for use by other organisations (videos or interactive media developed to support the information campaign could be used by industry for training purposes).
Option 7: EU-wide web site	• Greater public and industrial EU-wide access to information on biocides and the issues (health (human and environment), safety and sustainability) that surround their use • EU-wide source of best practice guidance.
Option 8: National web site	• Greater public and industrial awareness of biocides and the issues (human and environmental health, safety and sustainability) that surround their use • Local use patterns and legislative variations will be covered (not for web sites that simply translate an EU-wide web site (Option 7)) • Guidance will be available in users' own national language • Greater availability of best practice guidance in general.
Option 9: Help desks to provide information on best practices	• Could provide users of biocides with an easy point of access to information on best practices in the sustainable use of biocides • Could provide more in-depth and focused information than the web site • An EU-level help desk could provide consistent guidance on best practices across Member States (perhaps developed under Options 3 and 4) • National help desks could provide explanations of local use patterns, industry structures, training availability and legislative requirements • On a national help desk, guidance would be available in users' own national language • National help desks could provide user specific guidance and respond to user concerns or problems.
Links to policy structure	
Option 10: Include biocides in the NAPs for the sustainable use of pesticides	• Involvement of a wide range of national stakeholders • The existing consultative and other structures developed for pesticide use would provide a 'ready made' set of structures for biocides • NAPs could provide a strong mechanism for encouraging the adoption of best practice in industry and among professionals and raising awareness among the public.
Option 11: Create a working group to support sustainable use	• Support for the standardisation of best practice across the EU • Support for the dissemination and use of best practices across the EU • Support for the provision of best practice guidance from other options (e.g. by providing a forum for reviews of new best practice guidelines for EU level, such as those developed under Option 2 or reviewing plans for an EU web site (Option 7)) • Support for the consideration of other options, beyond best practices, for promoting sustainable use • Would provide a forum for bringing forward sustainable use at EU level.
Option 12: Use information gathered during the product authorisation process	• Makes use of information which is being generated anyway, under the authorisation process, to feed into the development of best practice guidance.

Options	Benefits
Policy options that involve legislative changes: Dissemination	
Option 13: Training and certification	• Potential cost savings through reduced use of biocides • Reduced risks of damage to the environment or health.
Policy options that involve legislative changes: Monitoring	
Option 14: Reporting on the use of biocides	• Could identify areas where the use of biocides may pose the highest risks and thus the best opportunities for the promotion of sustainable use.

7 Summary of findings

The objective of this study, as per the Commission's specifications, was to:

> "...help identify the existing best practices for all 23 product types that have been developed by the competent authorities of Member States or the industry in order to ensure a sustainable use of biocidal products...
>
> The information will help the Commission decide what role the best practices shall play in the future policy on the sustainable use of biocidal products."

Gathering and reviewing guidance documents

The information gathering identified a total of 471 documents that appear possibly relevant. One notable result is that over 80% of the possibly relevant documents prepared by government bodies and over 40% of those prepared by stakeholders come from only two Member States: Germany and the UK. This appears to be linked to roles given to best practice guidance in the regulatory structures of these two Member States.

Further analysis then identified potential best practice documents for 21 product types.[73] This analysis found that most of the potential best practice documents are intended for professional and industry users of biocides, and relatively few for the public and consumers. There have been some important efforts to reach the public. These include the following examples:

- The www.biozid.info web site recently launched by the German Environment Agency
- A public awareness document prepared by the Belgian Federal authorities
- Awareness raising and information documents on antifoulants (PT21) by NGOs such as the Green Blue in the UK

Biocidal product manufacturers have indicated that the most important method of communicating guidance to consumers at present is via the product labelling. The results indicate a gap in terms of best practice documents and awareness raising for public users of biocides.

An additional gap that was identified is that few of cross-cutting documents focus on microbial resistance, though some documents for PT2 biocides address this issue.

One further result is that, while the potential best practice documents touch on aspects of sustainable use, such as protecting human health, none of the potential best practice documents refer to the term "sustainable use".

Moreover, the review did not identify any EU-wide overviews of best practices; and it appears that there is little exchange of best practices among the competent authorities and industry. This confirms the view of the Commission (stated in the Technical Specifications) that these are two obstacles to the better exploitation of the potential offered by best practices on the sustainable use of biocidal products.

[73] The analysis did not cover PT16, as no active substances are in the review programme for this product type, nor PT20, which would not be included under the Commission's proposal for a Biocidal Products Regulation to replace the current directive.

Interview results

The in-depth interviews identified a further series of results.

- None of the organisations contacted had a definition of sustainable use for biocides, though a few refer to the broader concept of sustainability. This reinforces the gap between sustainable use and best practice documents noted above.

- Interviewees judged that best practice documents had brought positive benefits: reducing exposure to professionals and consumers, reducing environmental releases and reducing costs. None had monetary results, however.

- The process of developing best practice is generally based on a participatory approach (although the number of stakeholders, types of consultation and extend of consultation vary)

- A few of the officials interviewed had information on results gathered informally via contacts. In one case, a survey was used to assess the uptake of a best practice document. Overall, however, the interviews indicate that few organisations have formal monitoring processes in place to assess the results of their best practice.

- In other comments, one Member State official suggested that further research is needed, in particular on non-chemical alternatives to the use of biocides.

The interviews, together with a review of the use of best practice documents in other policy areas, have shown that in most cases there are strong links between the use of best practice documents and the policy framework. For biocides, this is the case in Germany and the UK, the two countries which produce the majority of best practice documents in the EU.

Policy options

The study has identified 14 possible options to promote the use of best practices for the sustainable use of biocides in the EU. Of these, 12 could be put in place without legislative action at EU level. An estimate of the costs of these options has been made. These costs range from negligible for the option to use of EU-funded research (funded through existing programmes) to over €32 million for the development of web sites in all Member States. The benefits from the different options have also been reviewed in qualitative terms: due to the lack of data it has not been possible to make quantitative estimates.

Table 7.1 below lists the options and provides an overview of their estimated costs and benefits.

Table 7.1: Potential benefits associated with each option

Options	Costs	Benefits
Options to strengthen the development of best practice (without legislative changes)		
Option 1: EU-funded background research (per project per year)	No additional cost (funded through existing programmes)	• Increased knowledge of the impacts of biocides on target organisms, the environment and human health • A basis to prioritise any further action • Provision of the knowledge required to improve best practice on sustainable use of biocides use.
Option 2: EU-level procurement process to develop guidelines	€0.2 to €1.6 million (depending on number of documents and languages)	• Increased availability of best practice • Standardisation and harmonisation of best practice across EU.
Option 3: National best practice transferred to EU-level	€1.1 million to €19.6 million (depending on number of documents and languages)	• Making existing best practice guidance more widely available, by translating it into a range of EU languages • Encouraging harmonisation of best practice across EU.
Option 4: Best practice developed by stakeholders through standardisation process	No net cost; recouped through sale of standards	• Wider availability of best practice guidance, via the communication networks of CEN and national standards authorities • Standardised best practice across EU.
Option 5: Addressing biocides within the BREFs under IPPC	€0 to €22.5 million (depending on whether carried out as part of normal revision or through separate revisions)	• Integration of biocides best practice into EU wide guidance for major industrial operations (i.e. all relevant guidance in one place) • Enhanced focus on best practice use of biocides by enforcement authorities • Standardised best practice across EU.
Dissemination		
Option 6: EU public information campaign	€1.2 million to €7.3 million (including industry supporting campaign)	• Greater public and industry awareness of biocides and the issues (human and environment health, safety and sustainability) that surround their use • Greater stakeholder awareness of best practice guidance • Greater stakeholder awareness of how to obtain best practice guidance • Provision of information/educational tools for use by other organisations (videos or interactive media developed to support the information campaign could be used by industry for training purposes).
Option 7: EU-wide web site	€1 million plus €0.1 per year for maintenance	• Greater public and industrial EU-wide access to information on biocides and the issues (health (human and environment), safety and sustainability) that surround their use • EU-wide source of best practice guidance.
Option 8: National web site	€1.8 million to €32.4 million plus €0.3 to €3.5 million per year for maintenance (depending on degree of separate national content)	• Greater public and industrial awareness of biocides and the issues (human and environmental health, safety and sustainability) that surround their use • Local use patterns and legislative variations will be covered (not for web sites that simply translate an EU-wide web site (Option 7) • Guidance will be available in users' own national language • Greater availability of best practice guidance in general.

Options	Costs	Benefits
Option 9: Helpdesks to provide information on best practices	€0.5 to €0.8 per year (EU wide helpdesk) €10.8 to €21.6 per year (27 national helpdesks)	• Could provide users of biocides with an easy point of access to information on best practices in the sustainable use of biocides • Could provide more in-depth and focused information than the web site • An EU-level help desk could provide consistent guidance on best practices across Member States (perhaps developed under Options 3 and 4) • National help desks could provide explanations of local use patterns, industry structures, training availability and legislative requirements • On a national help desk, guidance would be available in users' own national language • National help desks could provide user specific guidance and respond to user concerns or problems.
Links to policy structure		
Option 10: Include biocides in the NAPs for the sustainable use of pesticides	Below €0.3 million per year to authorities Costs to users cannot be quantified	• Involvement of a wide range of national stakeholders • The existing consultative and other structures developed for pesticide use would provide a 'ready made' set of structures for biocides • NAPs could provide a strong mechanism for encouraging the adoption of best practice in industry and among professionals and raising awareness among the public.
Option 11: Create a working group to support sustainable use	Re-imbursement of expenses, only	• Support for the standardisation of best practice across the EU • Support for the dissemination and use of best practices across the EU • Support for the provision of best practice guidance from other options (e.g. by providing a forum for reviews of new best practice guidelines for EU level, such as those developed under Option 2 or reviewing plans for an EU web site (Option 7)) • Support for the consideration of other options, beyond best practices, for promoting sustainable use • Would provide a forum for bringing forward sustainable use at EU level.
Option 12: Use information gathered during the biocidal product authorisation process	No additional cost – can be carried out within other options	• Makes use of information which is being generated anyway, under the authorisation process, to feed into the development of best practice guidance.
Policy options that involve legislative changes: Dissemination		
Option 13: Training and certification	Costs cannot be quantified	• Potential cost savings through reduced use of biocides • Reduced risks of damage to the environment or health.
Policy options that involve legislative changes: Monitoring		
Option 14: Reporting on the use of biocides	Costs cannot be quantified	• Could identify areas where the use of biocides may pose the highest risks and thus the best opportunities for the promotion of sustainable use.