OR 37/2010

HENVINET

Information materials for external users and dissemination plan

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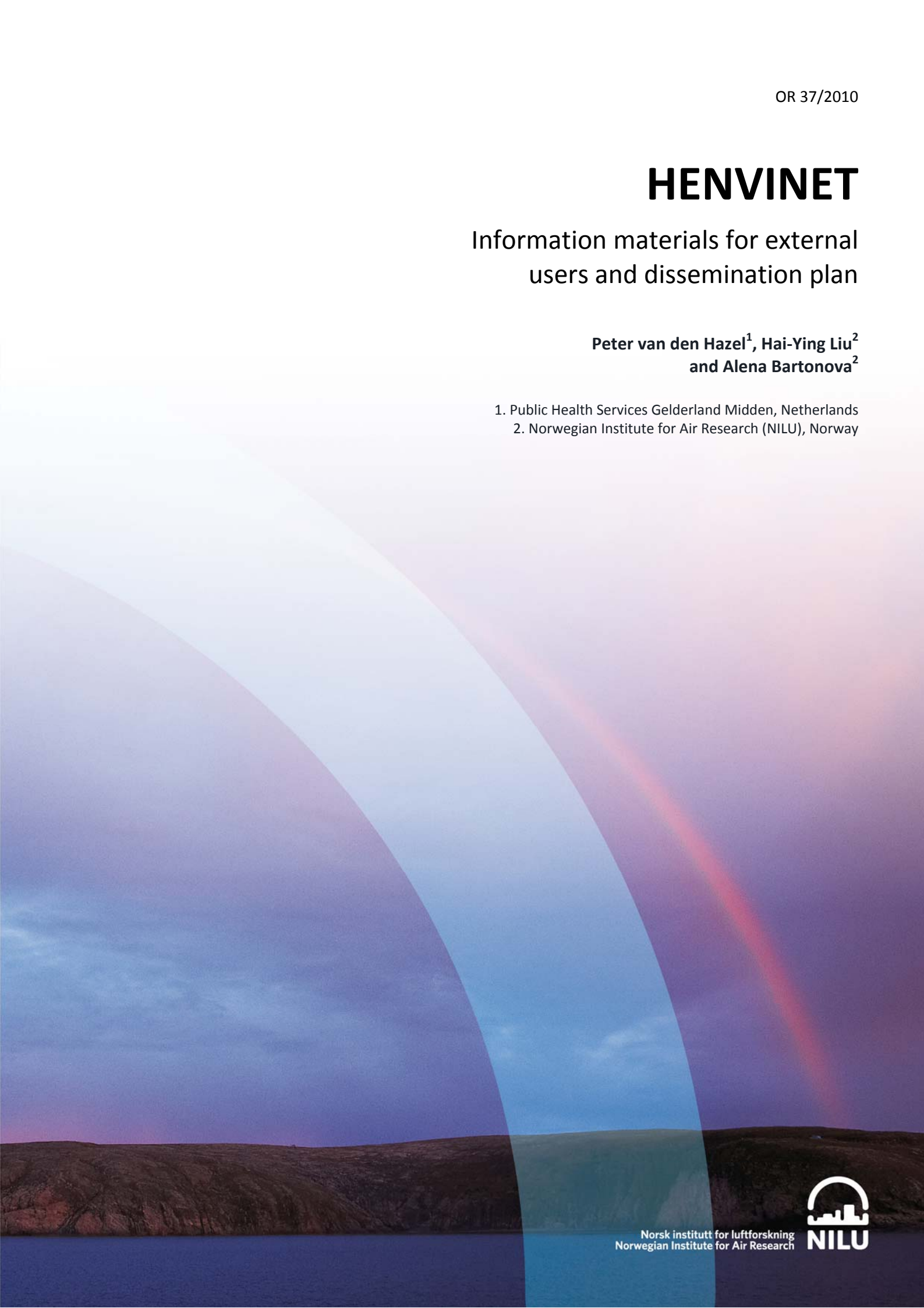

Norsk institutt for luftforskning
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Preface

This report is deliverable 3.8. of the project 'Health and Environment Network. The project was funded under EU Sixth Framework Programme of Research Thematic Area "Sustainable Development, Global Change and Ecosystems", Contract Number GOCE-CT-2006-037019. The aim of this project is to support the development of integrated health and environment policies supporting the European Environment and Health Action Plan (EHAP) and feed into the Environment and Health Information System (ENHIS).

The project contains 32 partners:

- Norwegian Institute for Air Research (NILU), NO
- National Veterinary Institute (NVI), NO
- The Ecobaby Foundation, NL
- University Hospitals Bristol NHS Foundation Trust, UK
- Public Health Services Gelderland Midden, NL
- Food and Environment Research Agency, UK
- Slovak Medical University, SK
- Institute of Food Bioresources (IBA), RO
- Italian National Agency for New Technologies, Energy
- and the Environment (ENEA), IT
- World Health Organization (WHO) –European Centre
- for Environment and Health, INO
- University of Hertfordshire, UK
- Netherlands Organisation for Applied Scientific
- Research (TNO), NL
- Finnish Meteorological Institute (FMI), FI
- Directorate General Joint Research Centre (JRC), INO
- Piemonte Region, IT
- Institute for Medical Research and Occupational Health, CR
- Umeå University, SE
- Slovak Technical University, SK
- Norwegian School of Veterinary Science (NVH), NO
- Stockholm University, SE
- University of Southern Denmark, DK
- Wageningen University, NL
- National Centre for Scientific Research "Demokritos", GR
- University of Oslo, NO
- Argentinean Association of Doctors for the Environment (AAMMA),AR
- Peking University School of Public Health, CN
- Integral University, IN
- National Cancer Research Institute, Genoa, IT
- eThekwini Municipality, ZA
- National Institute for Public Health of Mexico (INSP), MX
- National Institute of Health (ISS), IT
- University of Antwerp, BE

The project focuses on the four priority diseases identified in the EHAP

- Asthma and allergies
- Cancer
- Neurodevelopmental disorders
- Endocrine disrupting effects

The specific objective of this project is to collect, review and structure existing information with relevance to policy as one of the key focus in the reviewing method. The project has established expert teams for each of the four priority diseases and will summarise the current scientific basis regarding the links between health and environment. The purpose is also to identify and evaluate the methods and Decision Support Tools (DSTs) best suited for supporting policy makers in their work on finding the best measures for reducing the environmental stressors that effect human health. An additional objective of HENVINET is to improve the quality of work on projects which link science and the daily practice in public health related to health and environment.

The aim of this report is to describe the different levels of communication and dissemination within the network. Furthermore, the plan describes the communication and dissemination objectives, the communication tools, strategies, timing and target audiences. The communication and dissemination plan is required according to the contract with the European Commission. This document is the final update of the communication and dissemination plan of HENVINET.
For more information, please contact the project coordinator Dr. Alena Bartonova, E-mail: aba@nilu.no or project manager Dr. Hai-Ying Liu, E-mail: hyl@nilu.no.

Project No. 037019

HENVINET

Health and Environment Network

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Dissemination and communication plan

Introduction

HENVINET is built on a consortium of 32 Institutes and Universities. The project includes 32 partners from 17 countries of which five are outside Europe. HENVINET shall support the development of integrated health and environment policies supporting the European Environment and Health Action Plan (EHAP) and feed into the Environment and Health Information System (ENHIS).

The project focuses on the four priority diseases identified in the EHAP

- Asthma and allergies
- Cancer
- Neurodevelopmental disorders
- Endocrine disrupting effects

The aim is to collect, review and structure existing information with relevance to policy as one of the key focus in the reviewing method. The project has established expert teams for each of the four priority diseases and will summarise the current scientific basis regarding the links between health and environment. The purpose is also to identify and evaluate the methods and Decision Support Tools (DSTs) best suited for supporting policy makers in their work on finding the best measures for reducing the environmental stressors that effect human health.

An additional aim of HENVINET is to improve the quality of work on projects which link science and the daily practice in public health related to health and environment.

It is important that the different players within this network know how to communicate with each other and with the stakeholders in the Environment and Health field. A workpackage is built around the internal communication through a website.

The communication and dissemination plan is necessary to describe the different levels of communication and dissemination within the network. Furthermore, the plan describes the communication and dissemination objectives, the communication tools, strategies, timing and target audiences. The communication and dissemination plan is required according to the contract with the European Commission. This document is the final update of the communication and dissemination plan of HENVINET.

Background

The projects' main outcome will be the scientific results from the four thematic projects. These results have to be communicated to different stakeholders. In addition to these scientific results, HENVINET strives to communicate about its strategic role and place in the interactive field of environmental health. This means that the communication will have a content level as well as a strategic

level. Most scientific results will be generated at the end of the project in 2009. Until that time ongoing activities within the project will be communicated. The identification of target audiences is important to send the right messages from the project and to guarantee a valid usage of the outcomes of the project. In a wider circle of dissemination the general public should benefit of the outcome of the projects through change or adjustment in policy.

The communication and dissemination plan has to reckon with the heterogeneity of the stakeholders in the field of environment and health. Besides, the topic of environment and health can sometimes be politically sensitive. This makes the dissemination and communication an area of careful consideration and preparation.

This starting point gives the HENVINET project an interesting challenge to reach the aims in a few years time.

Communication objectives

The overall aim of the project is to build long-term scientific co-operation and collaboration between researchers, policy makers and other stakeholders in the area of environment and health. Such collaboration would be of little value if it were confined only to the limited number of consortium members. Thus the project consortium, a highly interdisciplinary group, faces two challenges: to find a common language within the consortium, and to find a durable way to promote communication with their peers outside the consortium. These challenges have to be overcome while working on the specific aims, and are integral to the processes leading to dissemination of knowledge and best practices, towards defining a common framework for validation and exploitation of research results and research-based tools and methods, and towards providing this information in a form that can be used by the policy-oriented stakeholders.

The objectives of the communication within HENVINET are to:

- Establish and maintain the dialogue between policy makers, authorities, relevant institutions and the research community and to disseminate information on the state of the art in health and environmental science including the various sub-disciplines involved;
- Set up a structured interaction with Health and Environment programmes and related DG-Environment programmes;
- Provide the framework for and materials for dissemination of project findings to various stakeholders;
- Organise an internal discussion forum.

These objectives are linked to an integration of different disciplines active at the research institutes, governments, as well as universities. The work relates to the translation of actual questions from daily practice into scientific objectives; and the application of academic knowledge and expertise in practical policy-making decisions for addressing environment and health problems

Work package 3 has as its main task to devise appropriate formats for information dissemination, so that end users get the information in the form and with the contents they readily can use for their purposes. Supported by intensive communication with other WPs, the WP 3 will communicate the results of the project to policy makers, the scientific community, the external advisory group and the general public. The two-way interaction with policy makers (external advisory group) will bring important feedback to the various work packages and complement the iterative process of identifying knowledge gaps and information needs. In collaboration with WP1 and 4, the focus will be on dissemination of knowledge and best practices gained in research activities supporting the implementation of the European Environment and Health Action Plan.
The main activity within WP 3 is on the development and launch of a network portal. This portal is the crucial backbone of the project for dissemination of the project results and for the network between the different stakeholders in the field of Health and Environment.

Work package 2 (System and database) is in place with two main areas of work: to provide technical and communication support for WPs 1, 3 and 4, and to create an information system that can serve as an input element of the Environmental and Health Information System. This work package will give support to
1) external communications; 2) internal communications and use of project internal management tool.

There are several parts in the communication of the total project of HENVINET. Each form of communication aims at different stakeholders. HENVINET identifies different target groups for its communication. For each of the communication objectives different target groups have been identified. The communication objectives and stakeholders of HENVINET are:

Internal thematic communication

Internal thematic communication objective: the directly involved co-workers and staff at HENVINET-participating organisations are informed about the progress and results of the projects.

Internal thematic communication deals with:

- co-workers (institutes, organisations and universities) involved with the 4 thematic projects;
- staff (scientific officer) at the EU;
- the Management team at the coordinating organisation;
- staff dealing with environmental health at the participating organisations .

The internal communication takes place through emails and through the website.

Internal strategic communication

Internal strategic communication objective: the co-workers and staff at participating organisations are informed about the process, role and strategic goals of HENVINET.

HENVINET needs to be built during the first few years of its existence. Good internal communication and cooperation are essential for a strong foundation of HENVINET. HENVINET needs to win a clear position within the organisations dealing with environment and health issues, wherefore input is necessary of a broad range of co-workers at all participating organisations (Directors, Staff, account managers and other personnel). These persons are often the link to other stakeholders related to the field of environment and health.

Internal strategic communication deals with the following stakeholders:

- the directors of the participating organisations (strategic);
- the Management teams at the coordinating institute;
- staff at the subsidy provider European Commission;
- staff at organisations dealing with environmental health.

External thematic communication

External thematic communication objective: to transfer the results of the projects to the different stakeholders.

Relevant staff of different stakeholders, such as organisations which might want to use the outcome of the projects, should be kept informed on the progress and results of the activities within HENVINET.

Some ideas to support this objective:

- undertake activities to increase the general visibility of HENVINET to stakeholder organisations which deal with environment and health issues at a local/regional level;
- media have focused attention on HENVINET that places value on the activities of the network; at least all thematic parts have had media attention at the end of the project;
- local/regional authorities know about HENVINET and consider HENVINET as a platform to buy-in academic knowledge regarding environment-related health problems; at least 20 authorities (local, national or regional) have made contact with HENVINET about environment and health issues;

External thematic communication deals with:

- staff at participating organisations (other departments/units);
- expert groups;
- policymakers at local/regional/national authorities;
- research institutes;
- ministries;
- inspectorates;
- umbrella organisations in the field of health and environment;
- civil society groups, NGO's, networks;
- patient or consumer organisations;
- general public;
- media.

The staff of different stakeholders should be kept informed on the progress of the activities within HENVINET, besides having access to the aims, data and activities of the four different thematic projects, the database on Decision Support Tools and finally its results.

The different parts are described in detail below and in the table at the end of the communication plan in a stakeholders/tools matrix.

External strategic communication

External strategic communication objective: to increase the knowledge at stakeholder level about the role and strategic goals of HENVINET (external strategic communication). In the chapter "HENVINET - Science - Policy Communication and Stakeholder Engagement" a plan is set for the involvement of stakeholders, relevant to the work of HENVINET.

External group for strategic communication: stakeholders working in environmental health which might benefit from the information produced at HENVINET and who are in a position related to strategic policy-making, financing or decision-making:

- directors/MT participating organisations;
- directors/Professors/MT universities;
- subsidy providers (strategic → for continuation of network);
- decision makers at local/regional/national/international authorities.
- MT/policy staff ministries.

There are a few suggested additional objectives of HENVINET which might be important in the definition of the strategic goals of the project. These items still need to be discussed within HENVINET:

- to get an active exchange of questions and answers between authorities/policymakers and HENVINET that places value on the activities in the field of environment and health; this has been taken care of through the portal;
- to get media buy-in to the concept of HENVINET; publications in EU-based publishers have been realised and are in press;
- to get media to run opinion editorials and news stories about the value-added HENVINET brings to their communities; this has proven to be difficult due to the amount of open research questions in WP1;
- to provide the general public with information that highlights the value of HENVINET and the results of the individual projects. A general leaflet/brochure is still under development.

The tools, stakeholders and timing are brought together in the table 1 below.

Tools

There will be a range of communication tools applied. For the different objectives and stakeholders different tools are needed. Tools that are going to be used for internal communication:

- staff meetings, MT-meetings, reports, workshops, literature reference sessions, brochure, leaflet, direct email, invitational conference, newsletter, personal contacts, website, presentations.

Tools that are going to be used for external communication:

- brochure, leaflet, direct email, invitational conference, newsletter, personal contacts, website, presentations, articles in specialised journals, interviews, reports.

The specific applications of these tools are given in the table with the stakeholder/tools matrix at the end of the plan.

HENVINET - Science - Policy Communication and Stakeholder Engagement

A HENVINET - Integrated Policy Perspective (HIPP) was developed before the annual meeting in Rome. The HIPP focus was defined around the development of a framework to support science policy communication as follows:

- Development of an integrated policy orientation on the health - environment relationship;
- Development of common understandings supporting the definition, preparation and assessment of project deliverables;
- Development of a framework for the definition of the policy making community and communication with the policymaking community;
- Provision of support for the development of the dissemination strategy and communication tools.

The HIPP Implementation plan is closely linked to other WP's particularly Work package 3 - Interaction with Policy and Dissemination and work package 4 - Decision Support Tools
As a consequence of discussions in Rome and subsequent discussions within the framework of WP3 Communication Plan a refined focus was identified as follows:

- **External Communication – across science – policy interface**
- **Network building – long term sustainability**

This focus relates particularly to the following objectives:

- Development of an understanding of the scope of the policymaking community and its strategic focus, institutions and structures;
- Framework for communication with stakeholders - basis for addressing - language and means and mode of communication – the policy making and the science community;

- Support for development of dissemination strategy and communication tools and development of an understanding of the most effective communication and dissemination strategies;

- Development of an understanding of the integrated monitoring information needs of policymakers as inputs to the DST specification.

The proposal for Stakeholder Engagement, below, is developed according to the following activities, builds upon and integrates with the outputs of the HENVINET questionnaire and addresses objectives identified above.

Stakeholder Engagement – Engagement Pack and User Platform

a) Engagement Pack

Identification of key stakeholder sectors at National and European levels, to form a core group for initial dedicated user workshops. These are likely to include:

- Data providers
- Research users
- Policy users
- Media users
- Public and private users
- Educational users

Production of background material to explain the aims and anticipated services of Henvinet and the stakeholder consultation process in the form of a 'Stakeholder Engagement Pack'.

Assessment of stakeholder requirements to ensure consistency in user engagement:

Four approaches are deployed to assess stakeholder requirements: questionnaires, Conference, workshops and national case-studies.

b) User Platform

The User Platform provides the principal means of communication between the user community and the other ad hoc working groups of HENVINET. It builds on existing user federations and user groups to promote collaboration and discussion. This activity has been renamed as HENVINET portal.
The filling of the portal with content is very important. All partners have to work on this issue.

The Portal and the technical tools to support it are developed through dialogue with a range of stakeholders.

The perspective on the stakeholders in **HENVINET** divides into 3 types:

i) Data providers

ii) Researchers and information generators
iii) Policymakers including data, information and knowledge users

It is of course possible for a single stakeholder to be in all 3 categories.

Monitoring of Engagement Activities in Order to Increase Commitment

Once we have established a portal for stakeholders we need to monitor their engagement in the work of HENVINET. We can use the following steps to monitor the engagement:
• Use a stakeholder management register to monitor stakeholder contact on an ongoing basis as part of the project management approach.

• Review the register on a regular basis to ensure that all activities are appropriate to the analysis i.e. no key stakeholders' needs are being ignored.

• To confirm achievement of a level of commitment; identify useful indicators to understand the actual stage of commitment achieved.

For example:
What signs show a stakeholder being at the level of commitment?
How can these levels be interpreted in ordinary, day-to-day behaviour?
How can these insights into different commitment levels assist us to carry on/improve/change project?

• Each stakeholder experiences critical points at different stages of commitment. Stakeholders show visible support for the program or show no interest.

• At these critical points, focus additional energy on activities that both educate and expand understanding. For example, include workshops or one-on-one meetings to enhance a stakeholders' level of commitment or introduce targets to the proposed benefits of the project and the direct effect the activities will have on them.

Distribution of tasks

The different tasks within the dissemination and communication activities have to be delegated to the different participants within HENVINET. In table 2 the workplan of the communication is collected. A few key persons for the communication are mentioned below. The responsible organisations for different products of HENVINET are given in table 2.

Development of Stakeholder Engagement – Engagement Pack and User Platform

- Work package 3 leader (Peter van den Hazel, HGM)
- Consultant (David Ludlow, Euronet)
- Some key work package partners

Spokespeople to the media:

- Project coordinator (Alena Bartonova, NILU);

- Partners (all).

Contact to other projects/programmes:
- Project coordinator (Alena Bartonova, NILU);
- Partners (all).

Articles:
- All partners.

Contact to project funder (European Commission):
- Project coordinator (Alena Bartonova, NILU).

Table 1: Target groups, their needs and the information HENVINET will give them on a content level.

Who	*What are their objectives?*	*What are their top priority info needs in this area?*	*What info can we communicate with them?*	*How can we communicate with them?*	*What use could they make of the information?*
Policy makers					
National authorities	Implementation, monitoring and assessment of environment and health policies at the countrywide level.	Info about public health relevance of pollution. Info which is comprehensive, up to date, Information on new developments and findings in research. Information that is policy relevant.	The results of the projects within HENVINET. A specialist assessment of risks and/or new issues of potential concern.	Reports (2010), presentations, email, meetings (ad hoc) , work shop (each year), press releases, newsletter (2x/year)	In decision-making and policy development. Prioritise EH issues of national concern. HENVINET reports could be a source for relaying information to the public.
Local/ regional authorities	Compliance with national, regional and local policies at the local or regional level.	Info about public health relevance of pollution at the local level. Information on new developments and findings in research. Information that is policy relevant at the local level.	The results of the projects within HENVINET. A specialist assessment of the relative importance of risks and/or new issues of potential concern. Practical information to implement policies at a local or regional level	Reports (2010) , presentations (ad hoc), email, meetings, work shop (each year), press releases, newsletter (2x/year)	In decision-making and policy development. Prioritise issues of local/regional/national concern. HENVINET reports could be a source for relaying information to the public, their members.
International, e.g. WHO, EEA, JRC	Negotiation and compliance of bilateral, international agreements.	Additional info on environmental health in Europe; more specifically the integration of available information	An overview of what is going on in relation to the four HENVINET projects	Reports (2010), presentations (ad hoc), email, meetings, presentations at conferences (ad hoc)	In decision-making and policy development.
Industry					
Industry	To engage efficiently,	Overview of the present legislative	We can provide them with	WEB (ongoing),	Development and refinement of

Who	*What are their objectives?*	*What are their top priority info needs in this area?*	*What info can we communicate with them?*	*How can we communicate with them?*	*What use could they make of the information?*
	responsibly and profitably in the oil, gas, chemicals and other selected businesses and to participate in the search for and development of other sources of energy. As well as to seek a high standard of performance and aim to maintain a long-term position in their respective competitive environments.	requirements in Europe. Impact of the industry on environmental health in Europe (local and long-range). Impact of their products on environmental health in Europe (local and long-range). To have legislation (REACH) that fits the objective of industry	an identification of responsible pollutants, uncertainty and scientific information on environmental health.	reports (2010), presentations (ad hoc), email, meetings, work shop (each year)	programs aimed improving products/facility emissions and reducing their impact on E&H. Addressing future E&H issues of potential concern. Develop internal policies that take into consideration innovative and protective measures for health
NGO/advocacy groups					
Patient Public Health, including health rights groups	Improving the health condition and quality of life of the population with health problems throughout Europe. E.g. promoting the interests of patients with airways and allergy diseases. To promote a healthy life in a healthy environment.	Information to help define an integrated strategy to avoid/reduce exposure, especially for sensitive groups. Info which is explicit on uncertainties Information that is specified for vulnerable target groups Information which will enable public health professionals to consider health issues better	Summary/overview of the health effects of exposure to outdoor air pollution.	WEB (ongoing) Reports (2010), presentations, email, factsheets, newsletter (2x/year)	HENVINET reports could be used as starting point for policy development and campaigns. HENVINET reports could be used as a source for relaying information about environmental health (particularly exposure and strategies to avoid exposure) to their members and those suffering from respiratory or other health problems.
Consumer organisation	Promote legislation to give consumers the right for a clean and healthy environment.	Information on diseases, related to the environment.	Summary/overview of the health effects or results related to the four HENVINET topics	Fact sheets, summary Reports (2010), presentations at meetings (ad hoc), email, newsletter (2x/year)	HENVINET reports could be used as evidence to promote legislation in a direction towards clean environment
Environme-ntal organisation	Independent, campaigning organisation that uses non-violent, creative confrontation to expose global and local environmental problems, and	Better knowledge on health effects from pollution on health, ecosystem, materials and cultural heritage An expert summary of the up-to-	Summary/overview of the results related to the four HENVINET topics	Fact sheets, summary Reports (2010), presentations at meetings (ad hoc), email, newsletter	HENVINET reports could be used as starting point for campaigns and policy development. HENVINET reports could be a source for relaying information to

Who	*What are their objectives?*	*What are their top priority info needs in this area?*	*What info can we communicate with them?*	*How can we communicate with them?*	*What use could they make of the information?*
	propose solutions for a green and peaceful future.	date information in the scientific field (strengths and weaknesses of the data).		(2x/year)	the public, their members.
Health care professionals	To help defend the environment both locally and globally to prevent numerous illnesses, ensure the necessary conditions for health, and improve the quality of life.	Information to help define an integrated strategy to avoid/reduce exposure especially for sensitive groups. Info which is explicit on preventing health effects Information that is specified for treating people	Summary/overview of the health effects of exposure to pollution and noise Show practical information that can be used in daily health care practice if available	Reports (2010), presentations (ad hoc) , email, meetings, work shop (each year)	HENVINET reports could be used as starting point for campaigns and policy development HENVINET reports could be a source for relaying information to doctors and other health care professionals.
Knowledge/ Research institutes					
	Establish research agendas Establish policy oriented research agendas Improved and more efficient diffusion and exchange of environmental health research findings.		Results in environmental health research by discipline (as provided per theme). Experience and value of network project	Publications, end-reports (2010)	Learn about different ways of sharing research information. Establish research agendas based on where there are gaps in the knowledge and policy needs.
HENVINET participants					
Members and contractors		To enable the members to participate in the dissemination of the outcome of the project they need to know what they are meant to do within HENVINET, why they are meant to do it, which the output is aimed at and how they are meant to do it.	Reminders about what HENVINET's objectives are, who we are aiming our work at, what we want to achieve. Information/guidance on writing end reports etc.	Email updates Work group meetings (each year) Telephone conferences (2x/year) Website Newsletter (2x/year) Invitational conferences	Help them to write their sections for the end reports in a user-friendly style which is aimed at the target audience. We want them to engage in science policy process, communicate with other stakeholders. Meetings which involve all kinds of stakeholders will facilitate this.

Who	*What are their objectives?*	*What are their top priority info needs in this area?*	*What info can we communicate with them?*	*How can we communicate with them?*	*What use could they make of the information?*
Media					
	News distribution		HENVINET key messages and findings.	Press release on content Other relevant press releases Invitational conferences	Improve reporting on health and environment

Table 2: **HOW? - How HENVINET will get the information to the stakeholders; *HENVINET's output/products.***

Product	Details – what is it and what will it do?	Who is responsible?	Dissemination/Timing
HENVINET Description Brochure	A full colour HENVINET brochure was designed and prepared to advertise HENVINET. Brochures have been sent to a large number of interested people and have been taken to many meetings where HENVINET was presented. Brochures have also been sent to EU DG Research to advertise HENVINET to the research and policy community in "Brussels". A Spanish language version has been produced in July 2007	HGM/NILU	May 2007; More version in month 24, 42
Website	Static website design and implementation - First online application containing basic Information and functionality. As collection and dissemination of research data and policy relevant information is an important goal of HENVINET, the HENVINET internet website has been developed as a crucial information tool (http://HENVINET.nilu.no). This website contains the contact information, an overview of all participants, Work packages, projects, all projects' reports, including also announcements from other projects, institutes. The website also contains a number of internet links to other relevant websites, and the HENVINET website is advertised to other projects to be put on their websites as well. The website also contains minutes of meetings and terms of reference for different tasks within the project. A Wikipedia has been produced to enable better communication between the network members.	NILU/CSL	First online website spring 2007;Ongoing at least until end of project
D2.2 Online resource	Implementation of internal project document site - Online resource for document storage and retrieval	CSL	January 2007
D2.3 Online resource	Dynamic site launch, release of web portal with extensive content and functionality	CSL	February 2007
D3.2 Report	Dissemination strategy	HGM	August 2007
D5.2 Report	First annual Periodic reports to the Commission	NILU	12
D1.2 Report	First annual review of research and best practices	WHO	14
D3.3 Written material, reports or factsheets	Project information materials for external users	HGM	14
D3.4 Report	1st update of dissemination plan	HGM	14
D4.2 Report	First review of Decision Support Tools and framework for validation	ENEA	14
D3.5 1st project meeting in Rome	Report from 1st project meeting in Rome	HGM	16
D2.4 Demonstrator	Metadata base launch, release of searchable database of projects and best practice information	CSL	18
D5.3 Report	Second annual Periodic reports to the Commission	NILU	24
Workpackage meetings	Purpose of these meetings is for work package participants to discuss and interpret environmental health research which is to form the content of the end-reports. The meetings are also an opportunity to plan the progress of the end reports.		One - two meetings per year (for each WP or in combination)
Kick-off meeting – Oslo	Outcome can be found at HENVINET website		January 2007
D3.7 2nd annual conference	Report from 2nd project meeting	HGM	27

Product	Details – what is it and what will it do?	Who is responsible?	Dissemination/Timing
D3.6 Report	Project information materials for external users and 2nd review of dissemination plan	HGM	26
D5.4 Report	Third annual Periodic reports to the Commission	NILU	36
D3.8 Report and other materials	Information materials for external users and 3rd dissemination plan update	HGM	38
D2.6 Demonstrator	Portal extensions, additional portal development based on requirements of the various WPs in year 3	CSL	41
D1.4 Report	Final review of research and best practices, recommendations for exploitation and utilisation	WHO	42
D3.9 Report	Report on raising public participation and awareness and report from final project meeting	HGM	42
D5.5 Report	Final reports to the Commission	NILU	42
D5.6 Report	Minutes from meetings and workshops	NILU	In month 4, 10, 15, 21, 27, 35, 42
Newsletter	Purpose of HENVINET Newsletter is to provide HENVINET participants and interested parties with an update of the progress HENVINET. The newsletter provides a forum for advertising upcoming events in HENVINET and in the field of environmental health such as HENVINET conferences and meetings. The newsletter also aims at expanding HENVINET's audience. The newsletter is distributed at conferences and is available to download from the website.	HGM/NILU	October 2007 March 2008 Sept 2008 March 2009 Sept 2009 March 2010
Press release	Press releases should be sent out to advertise the HENVINET results and the production of end-reports and other products.	NILU/HGM	Summer- Autumn 2009
Posters for meetings	Posters will inform conference participants of HENVINET activities. The exact content and message of the poster will change depending on the focus of the conference/meeting.	NILU	Ongoing
Publications (academic))	A series of scientific and non-scientific summaries of the HENVINET process and it's outputs for the academic community	NILU/HGM	Starting January 2008
Stakeholder management register	A register to keep track of the engagement of stakeholders in the activities of HENVINET	NILU/HGM	Starting May 2008

Table 3: Further suggestions for products (not budgeted)

Product	Details – what is it and what will it do?	Dissemination/Timing
Additional workshops (during and at end of HENVINET?)	Workshops on specific themes in cooperation with other EU-funded programmes	Ongoing
Summary flyer/brochure	A series of non-scientific summaries of the HENVINET process and it's outputs for different stakeholders.	January 2009
Power Point Presentations	Easy to use and understand presentation of HENVINET and its outputs that can be used by non-scientists to present amongst the stakeholders.	January 2009
Info pack	A collection of the above mentioned products collected into a package tailored towards a specific stakeholder group.	January 2009

Strategy proposal for Stakeholder Engagement

Stakeholder Engagement – Engagement Pack and User Platform

USER ENGAGEMENT STRATEGY

1. Purpose

This strategy outlines a plan for achieving success in engaging with our external users. To successfully capture a higher level of feedback on our service provision overall, whilst significantly looking at ways to better engage with those users with a low level of response to our activities.

2. Broad Objective

HENVINET seeks to ensure that it provides the services its users want, when they want them in the way in which they want to receive them. It has a broad programme of knowledge exchange and consultation of individuals and groups on a regular basis. The data and information HENVINET obtains and provides in the course of the exploitation of the portal together with an evaluation of its performance is used to determine user priorities and levels of satisfaction over time and to identify any need for change or improvement to the delivery of its services. The participation of the users is crucial for any activity within the network. One final objective is even that the portal will become self-supporting by the input from its users.

3. Definition of success

A high level of feedback will provide us with the assurance that our users have been given adequate opportunity to provide us with feedback, and that they continue to be satisfied with the level of service they receive. Additionally, the feedback will help identify improvement opportunities. This strategy should be endorsed by the network participants, but also preferably by the end-users as well.

4. HENVINET's principal users

HENVINET's principal users are identification of key stakeholder sectors at National and European levels. They include:

- Data providers
- Research users
- Policy users
- Media users
- Public and private users
- Educational users

Each user group may come into contact with us for different reasons and under different circumstances. To ensure we get meaningful feedback and that any action proposed and/or taken best meets user needs, we must consider several factors. The Service has commenced work on a fundamental change programme to ensure that The Service can deal efficiently and effectively with the challenges that it will meet in the next five years to ensure that The Service can continue to deliver a modern first class service to our customers. Projects include the replacement of all our major case management systems and a major upgrade to

our IT infrastructure. Whilst the projects mainly only impact on those who work for The Service, the new technology will provide opportunities to interact with our customers via the internet in the medium to longer term. We are mindful of the need to fully engage with users going forward and a separate strategy is being developed to determine the best way of interacting with stakeholders.

a) Engagement Pack

Production of background material is to explain the aims and anticipated services of HENVINET, and the stakeholder consultation process in the form of a 'Stakeholder Engagement Pack'.

Assessment of stakeholder requirements needs to be performed to ensure consistency in user engagement:

Four approaches are deployed to assess stakeholder requirements: questionnaires, Conference, workshops and national case-studies.

b) User Platform

The User Platform provides the principal means of communication between the user community and the other ad hoc working groups of Henvinet. It builds on existing user federations and user groups to promote collaboration and discussion.

The User Platform and the technical tools to support it are developed through dialogue with a range of stakeholders.

The perspective on the stakeholders in Henvinet divides into 3 types:

i) Data providers
ii) Researchers and information generators
iii) Policymakers including data, information and knowledge users

It is of course possible for a single stakeholder to be in all 3 categories.

A questionnaire needs to discover something about all 3 of these stakeholder groups under the general headings:

(a) Needs (or expectations) about the kind of data or data products that they can produce or require;

(b) How they want the data or information delivered to them and

(c) Reservations or issues that need to be addressed.

Stakeholder Engagement Pack Specification

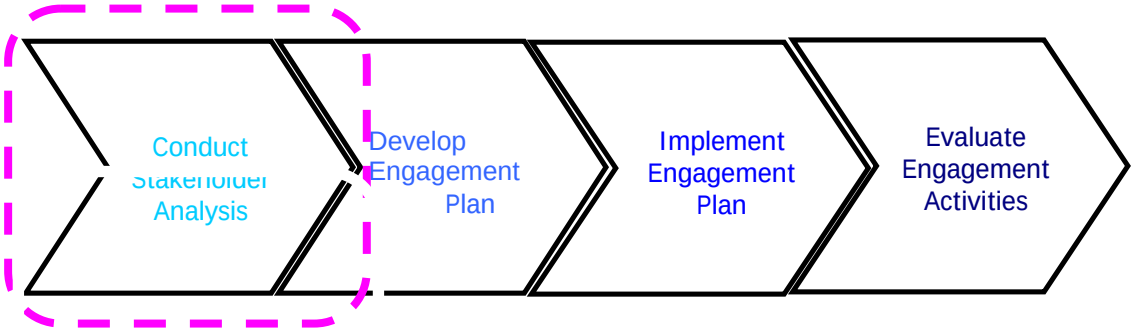
Contents:

- Setting the scene
- Stakeholders analysis
    1. Determine commitment level
    2. Assess needs/concerns
    3. Define role
- Development and implementation of the engagement plan

- Monitoring of engagement activities in order to increase commitment

First Phase of activity:

- identification of stakeholders
- classification of different categories of stakeholders
- implementing for each category the appropriate methodology of involvement



Stakeholder Analysis

WHY?

• To establish the needs, expectations and potential level of commitment of actors involved and/or to involve in project

WHEN?

• In parallel with the finalisation of the Communication Strategy

HOW?

1. Determine commitment level
2. Assess needs/concerns
3. Define role

1. Determine commitment level

Level of commitment	**Definition**	**Key questions**
Contact	•Informal contact.	
Awareness	• Awareness of the content and context of the project	•How well is each group informed about the project and its issues? •Do they realise that they will be affected by the issue?
Understanding	•Accepts the nature and intent of the project	•How well do the stakeholders actually understand what the project involves and how it affects them?
Buy-in	•Works toward project objectives by testing the new concepts and implications	•To what extent is everyone committed to and enthusiastic about the project? •Is there evidence of positive

	•Able to articulate commitment to the goals of the project	support/endorsement for the project?
Commitment	•Demonstrates personal ownership of the project	•How much real involvement and participation does the subject demonstrate? •To what extent is this project and its issues institutionalised?

2. Assess needs/concerns

Needs	**Concerns**
What outcomes do stakeholders expect as a result of the project?	For which stakeholders does the project help to meet their goals, needs, or interests (or not)?
What changes will stakeholders be expected to make as a result of the project?	What resources are stakeholders willing (or not willing) to provide for the project?
What direct benefit do stakeholders expect to get from the project?	How do stakeholders feel about each other?
	Do stakeholders have conflicts of interest concerning the project?

3. Define role

Influence	**Impact**
From where do stakeholders get their leadership authority (e.g., is it formal or informal)?	How will each stakeholder impact the project (negatively or positively)?
How much negotiating power or influence do stakeholders have over others?	If they can impact the project negatively, how can you prevent or correct the situation?
Who controls strategic resources for the project?	How much will these impacts affect the success of the project?
What legitimate authority do stakeholders have in the organization (e.g., are they responsible for budget)?	If the project is impacted positively, how can you make the most of it?

Monitoring of Engagement Activities in Order to Increase Commitment

•Use a stakeholder management register to monitor stakeholder contact on an ongoing basis as part of the project management approach

• Review the register on a regular basis to ensure that all activities are appropriate to the analysis i.e. no key stakeholders' needs are being ignored

•To confirm achievement of a level of commitment; identify useful indicators to understand the actual stage of commitment achieved.

For example:

What signs show a stakeholder being at the level of commitment?

How can these levels be interpreted in ordinary, day-to-day behaviour?

How can these insights into different commitment levels assist us to carry on/improve/change project?

•Each stakeholder experiences critical points at different stages of commitment. Stakeholders show visible support for the program or show no interest.

•At these critical points, focus additional energy on activities that both educate and expand understanding. For example, include workshops or one-on-one meetings to enhance a stakeholders' level of commitment or introduce targets to the proposed benefits of the project and the direct effect the activities will have on them.

5. Factors to be taken in to account when engaging our users:

Consideration should always be given as to what the responses will be used for, i.e. will the outcome of the survey provide answers to questions, inform an action plan etc. We will ensure that the engagement takes place at the appropriate time to make best use of the information received whilst ensuring that users are not subject to "survey fatigue". We will amalgamate or combine survey activity with other business strands to ensure best practise and provide best customer service to our potential respondents, especially if they are likely to come from the same pool.

Whether the engagement is face to face or in writing, language used will be equitable and even. We will not raise expectations in any explanatory notes or questions when drafting surveys or questionnaires but clearly explain what the information obtained will be used for. At the completion of any survey activity we will put in place appropriate systems to analyse data and feedback the results together with information about any improvement activity resulting from the survey activity.

We will also explore the inclusion of ethnic monitoring into survey activity so that we can determine the satisfaction levels broken down by ethnicity.

6. Ongoing and survey activity for 2009

Guiding principles

Our network user involvement activities will be:

- Two-way – encouraging and enabling a two-way flow of information and with coherent links to the developing service user Engagement Framework, which is underpinned by the Involvement Continuum:

Inform -> consult -> involve -> enable -> empower

- Open and transparent
- Accessible
- Consistent, regular and ongoing
- Honest

Monitored and evaluated

The 6 Principles of Stakeholder Engagement

By Raj Sharma -- Supply Chain Management Review, 10/1/2008

Among supply chain professionals in large, complex organizations, there is very little argument about the value of enterprise-wide supply management initiatives. Nor is there much debate about the benefits of a cohesive approach to using drivers of value like demand management, requirements development, and purchase volume aggregation.

But as anyone who has managed an enterprise-wide program knows, such efforts are fraught with big challenges, not the least of which is how to get real buy-in—and, in some cases, active participation—from key stakeholders.

Compared to more local or narrowly defined supply management efforts, enterprise-wide initiatives are more likely to impact varying groups of stakeholders with disparate perspectives and a broad range of interests. Neglecting to engage key stakeholders early and often—and with genuine intent to address their unique needs and concerns—is one of the most common points of failure of such initiatives. Too often, research teams spend months gathering data and developing strategies that are never implemented due to insufficient internal and external support.

But that doesn't mean that all enterprise-wide supply management programs are destined to fail, far from it. During Censeo Consulting Group's work supporting complex strategic sourcing initiatives in the U.S. federal government, where single-category spending often exceeds hundreds of millions of dollars; we've seen some remarkable success stories. We have observed that concerted, deliberate stakeholder outreach and management—from the outset—are critical factors that enable programs to gain traction and momentum and realize operational success.

This article discusses six principles for effective stakeholder engagement that organizations from any sector—public or private—should bear in mind when planning or managing a complex, large-scale supply management program. To illustrate these general principles, we share our firm's experience with numerous federal supply management and sourcing programs. Each example shows how early stakeholder identification and a strategic combination of outreach, communication, and involvement methods will invariably contribute to a program's success.

Principle 1: Get to Know Your Stakeholders

The key idea here is to develop a comprehensive understanding of whom your stakeholders are, what they care about, and how they relate to the initiative you're trying to launch.

The idea sounds simple enough, but many big supply management programs either neglect it altogether or limit consideration to the most obvious stakeholders. In fact, due to their scope and complexity, most enterprise-wide programs require a more comprehensive scan to identify the many disparate stakeholders involved and to understand the unique needs and interests of each.

In performing this initial scan, it's useful to view the stakeholder landscape from multiple dimensions: vertically, horizontally, and from outside the organization.

The Vertical Scan. The reach of most large-scale supply management programs extends all the way up to an organization's senior leadership ranks (where major budget and policy decisions are made) and down to individual end users (those

directly impacted by the program). Knowing the key players at each level of an organization, and how each relates to the program, is the first step toward crafting an effective outreach strategy.

The Horizontal Scan. Across an organization, there are likely to be many stakeholders whose roles relate to your planned program in different ways. Each "functional" stakeholder represents a different perspective and type of expertise. For example, in the case of an IT-oriented sourcing program, the IT community as well as the procurement community should have a seat at the table throughout the sourcing strategy development process. Similarly, an administrative services sourcing effort would want to include the HR professionals ultimately responsible for fulfilling an organization's staffing needs. While these examples may seem obvious, we've been surprised many times by the large disconnect between sourcing managers and the people within the organization who hold the real subject-matter expertise about the item being sourced. Often, the assumption on the part of the procurement organization is that they understand their customer's needs while the reality is that needs vary and are always changing across groups of customers.

A program's ability to identify key functional stakeholders and to recruit their participation depends largely on the type of commodity involved. For example, direct materials are likely to have distinct "owners" who already play key roles in acquiring and utilizing that commodity. However, indirect materials (that is, goods or services such as office equipment or lighting) may not have such clear "owners," a situation that can make outreach and change management efforts more challenging to execute.

The External Scan. Often, major sourcing programs will apply all their energy and resources to engaging the internal stakeholder community but will neglect the needs and interests of key external constituents. Suppliers, for example, can contribute a valuable market perspective to the sourcing strategy process—usually well in advance of any actual procurement.

Others, such as special interest groups or regulatory bodies, may have significant impact on a program. In the federal government, for example, small business goals weigh heavily in many procurement decisions. If a sourcing initiative is expected to affect opportunities for small business suppliers—either positively or negatively—outreach to small business interests is critical. Depending on the type and scope of the program, such external stakeholders may include the U.S. Small Business Administration, congressional committees on Capitol Hill, and small business industry groups.

Another example that is particularly applicable to the private sector concerns outsourcing production to a low-cost country. In developing such a strategy, sourcing managers must be cognizant of communities that could lose business as a result of the program. Engaging these communities early on can help to offset any potentially negative outcry or backlash that might derail the program. For instance, production of many of the Boeing 787 Dreamliner's main systems has been outsourced to suppliers across the world. The impact on the local communities that previously were involved in the production of those systems has in part led to the current labor upheaval and strikes that have disrupted production recently.

Exhibit 1 illustrates a high-level stakeholder map that our firm has developed for use in federal government supply management programs. In this example, we segmented the different stakeholder groups into six "tiers" to further clarify each group's relationship to the program in question. A stakeholder mapping exercise like this is useful for identifying stakeholder groups at an aggregate level. But a comprehensive stakeholder analysis must also consider the key individual stakeholders within each group because their buy-in and involvement are needed if the program is to be a success.

Once individual stakeholders have been identified, a useful exercise is to prioritize each based on two criteria: (1) the degree of influence they have on program outcomes and (2) their "attitudes" toward the program, either positive or negative. Highly influential stakeholders can range from senior executives responsible for "green-lighting" a supply management program to members of the acquisition community responsible for overseeing program execution. If a program's success depends on broad customer adoption—for example, purchasing administrative services through a designated supplier—the customer community may also be a highly influential group, and should be addressed as such.

Within each stakeholder community, a broad spectrum of opinions and attitudes about the supply management program will emerge. Most beneficial are the "champions" who understand the benefits of the proposed strategies and wholly embrace the program. But for every champion, there is likely to be a "challenger" whose interests are in some way threatened, or who simply does not see the benefits of the new approach. Strong champions and challengers are usually few in number (most stakeholders fall somewhere in between) But their potential impact on the program's success cannot be underestimated. So it's crucial to identify these "super stakeholders" early on and to develop an appropriate outreach strategy for each.

Exhibit 2 shows a stakeholder prioritization matrix, illustrating how individual stakeholders can be grouped loosely into the following four categories, with outreach strategies that are unique to each:

- *High-Influence Challengers:* Outreach efforts should focus on converting these individuals to champions. Failing that, plan countermeasures that could help to neutralize any actions they might take that could potentially harm or derail the program.
- *High-Influence Champions:* Proactively leverage the positive energy from these individuals to further program objectives and to build a strong foundation of support.
- *Low-Influence Challengers:* Maintain awareness of any actions that could potentially harm the program, but put less energy into converting these challengers to champions.
- *Low-Influence Champions:* Ensure that positive relationships are maintained, but put less energy into further cultivating these champions.

Principle 2: Engage as Early as Possible

Its human nature: Nobody likes to be surprised by change. Yet many large, enterprise-wide supply management programs are planned and developed more or less in a vacuum with the final plan delivered to stakeholders as a "done deal,"

ready for implementation. Strangely enough, the program's proponents are surprised when key constituents hesitate to jump on board.

It's not just fear or suspicion of change that drives human behavior. There's the ego factor as well. It's natural for people to take exception when excluded from any relevant decision-making process—even if the objectives are ones that they would ultimately support.

Our second principle calls for reaching out to key stakeholders at the program's inception and continuing to encourage participation, as appropriate, throughout the program's lifecycle. Our subtext is that it is essential to have the right mechanisms for doing so.

One reason organizations fail to engage key stakeholders early in the process is a critical misconception about the role of the program management organization (PMO). Some program managers (for example, commodity managers for sourcing initiatives) may feel solely responsible for defining and implementing best-value strategies, and may therefore feel compelled to drive research and strategy to the exclusion of others. But another, more constructive way to view the PMO is as a facilitator of strategy development. Ideally, the PMO serves as an honest, objective broker who aids key stakeholders in taking ownership of a major, new strategy. By following the six principles outlined in this article, PMOs can ensure that they don't isolate themselves—to the detriment of successful program implementation—during the early planning and research stages.

Let's take a strategic sourcing opportunity analysis as an example. In our first scenario, a dedicated sourcing team spends several weeks gathering and analyzing spends data across an organization to produce a comprehensive report recommending five commodities for strategic sourcing. The team compiles the data to demonstrate why these goods or services offer the greatest potential for delivering value. But what they lack is the support and backing of the procurement community, customers—and even key suppliers—to move their recommendations forward. We give this scenario a 50/50 chance of success.

But let's say that same sourcing team, once they've narrowed the opportunity analysis to a short-list of eight to 10 commodities, conducts a series of interviews or focus groups with functional experts, contract specialists, customers, and suppliers to gather additional input about the commodities in question. Such an approach achieves three objectives:

- It gives key stakeholders a sense of involvement in the process and lets them know their expertise and opinions are valued.
- It begins to educate stakeholders about the potential benefits of strategic sourcing and why these particular goods and services are being considered.
- It allows the sourcing team to gain additional, potentially valuable information and insight that may (or may not) support the findings compiled through data alone.

This was the approach our firm took when we were brought in to help manage a proposed enterprise-wide wireless sourcing initiative for the U.S. Department of Defense. Before beginning even the earliest research stages of the initiative, we identified and conversed with a range of key stakeholders, in particular chief

information officer (CIO) representatives from the U.S. Army, Navy, and Air Force. By the time we launched the kick-off phase of the program, we had already cultivated a sense of program "ownership" among these CIO offices. From that base of support, we were able to extend our outreach to other key stakeholder groups within each of the three military branches.

Early stakeholder engagement can take different forms, depending on the type of stakeholder, his or her relationship to the program, and his or her potential influence on program outcomes. (Remember our earlier stakeholder prioritization matrix.) Some stakeholders may require more active engagement, in the form of direct involvement in analysis and decision-making. For others, particularly senior executives or stakeholders who may be only indirectly impacted by the program, a less intense level of involvement may be more appropriate. Such individuals may desire involvement in major program decisions or milestones, but not in day-to-day program management and execution.

For example, we learned that the leadership council at a large Fortune 500 client, comprised of the most senior executives, had been asked to attend monthly strategic sourcing update meetings. Given their lack of direct involvement or impact, most of the executives ended up delegating attendance to subordinates and eventually even those subordinates stopped attending. The result: The leadership council meetings became meaningless. Instead of monthly meetings, quarterly meetings would have been sufficient and led to more meaningful updates and dialogue.

There's no question that early stakeholder engagement requires more energy and resources—as well as the willingness of the sourcing team to consider additional data and information as part of its strategy development process. But it's been our firm's experience that doing so can significantly increase the chances of program success.

Principle 3: Listen with Both Ears Open

Have you ever been asked to participate in a survey, yet you didn't believe your opinions would actually be considered? People can spot disingenuousness a mile away. And when they do, you can expect one of three possible outcomes—none of which helps bolster a program's chances for success:

- They tell you what you want to hear (but not what they really think) and then dismiss the program as a trivial exercise.
- They tell you what they really think, but they are full of skepticism and mistrust toward the program.
- They simply don't participate.

If you're going to take the time to ask stakeholders for their opinions or to open the doors for participation in a program's development, make sure it counts for something. You've got to be open to receiving and incorporating stakeholder input—even if it doesn't align with the program's vision and goals. Further, you need to make sure your stakeholders know that their participation counts for something. Real and effective stakeholder engagement must be more than just a compulsory "check" on the list. It must be valued by all parties involved.

Our firm was recently involved with one government-wide supply management initiative that encompassed an array of stakeholder interests and competing

agendas. One of the things we learned early on in our stakeholder engagement process was that the organization tasked with execution of the program—while supporting it in theory—did not have sufficient resources available to take on the additional workload that the program would require. The results were mixed signals: active participation during strategy development but a somewhat passive resistance to implementation.

Some supply management programs might have noted these concerns but pushed the program forward as planned. Our approach was to take the time to work with the stakeholder organization to develop a solution that would include an appropriate level of resources without requiring major structural changes. As a result, we've been able to build a community of committed participants that engages regularly and makes positive contributions to the program, such as providing regular input on customer needs and bringing insights into potential best practices at their organizations.

It goes without saying that any solution to address stakeholder needs or concerns should be jointly developed and based on real stakeholder input—not prescribed from above based on preconceived and potentially inaccurate notions of what will work.

Principle 4: Communicate, Communicate, and Communicate Some More

In any major supply management program, regular communications from the program management organization help to ensure that stakeholders are aware of the program's existence and basic purpose. But we also want stakeholders to have a clear understanding of the program's goals and benefits, as well a strong sense of how it may affect them personally in their jobs. At every point of communication, we also want to leave the door open for interactive dialogue—whether in the form of questions, feedback, or discussion.

Of course, every program will have its own unique communication objectives, messages and optimal communication channels. That said, we've found it helpful to bucket stakeholder communications into four categories, each with its own defined set of objectives.

Awareness Communications. The goal here is to build general knowledge and recognition of the program and its benefits across the full spectrum of stakeholders. Examples may include:

- Creating a small Web site or brochure that provides a high-level overview of the program.
- Showing top-level endorsement through regular, positive communications from senior leadership.
- Working with other publications—internal and external—to give positive visibility to the program through articles and announcements.

Program/Performance Communications. This form of communication keeps stakeholders informed of the program's status and performance throughout its lifecycle. These communications tend to be more specific and detailed than awareness communications, and are most appropriate for stakeholders directly involved in program development and implementation. Examples may include:

- Maintaining an intranet Web site that gives select stakeholders access to key program documents as appropriate (for example, budget and schedule documents, governance structure details, program contacts, etc.).
- Producing a periodic e-newsletter or other timely e-mail communications to provide program updates, communicate decisions and report performance.

To be most effective, program/performance communications should incorporate key metrics that are easy to measure and that help quantify program success. For example, the number of personnel trained may be a key metric for measuring change management for a supply management transformation initiative. At one organization, where a key goal was to increase small business participation, we provided regular updates on growth in small business spending to all relevant stakeholders. The small business office, resistant at the inception of the program, quickly became a proponent as it observed the trend and saw how the program helped achieve broader goals.

Change Management Communications. Their purpose is to help ensure a smooth transition from the current to the new environment after the program's implementation. The target audience is any individual whose job, or means of performing a job, will change as a result. For example, if procurement personnel and customers are being asked to follow a new process to purchase a certain category of goods or services, targeted communications are needed to explain the change and offer support. Examples may include:

- Memos outlining change requirements in detail for each relevant stakeholder group, including implementation timelines.
- A poster campaign to remind individuals of any new changes and their benefits.
- An incentive program to motivate participation (for example, cost savings shared with participating organizations).

Knowledge Transfer Communications. These are used to document and share key findings and best practices compiled throughout the program. They support workforce development and extend the value of the immediate program investment. They are important for stakeholders who become involved in the program some time after its launch, as well as for stakeholders who may become involved with similar enterprise-wide initiatives. Examples may include:

- Compiling findings, lessons learned, and best practices in documents that can be shared among appropriate stakeholder groups.
- Training and other learning programs for target stakeholders.

Clearly, not every type of communication is appropriate for every type of stakeholder. And the frequency and level of detail of each communication will vary depending on the relationship of the stakeholder to the program. Some communications may also serve multiple functions—for example, the program e-newsletter that combines program/performance details and change management information.

And, of course, developing and executing communications requires resources. We recommend developing a high-level communication plan at the outset that defines

the program's commitment to communications, outlines at a high level the scope of the program's communications and estimates the resources required to execute. Throughout this planning process, program managers can realistically assess the level of effort required and then "right-size" the communication plan as needed based on any resource constraints. This is also a good time to identify the individuals who will manage the various communications.

The U.S. Department of Defense's wireless sourcing effort, mentioned previously, is an example of an enterprise-wide program that has effectively integrated communications to recruit and to reinforce participation. Because the wireless program affects tens of thousands of users across the Department, we spent a lot of time planning our communication strategies—including identifying our key stakeholders, defining their various roles and developing the best methods to reach them. Through the early and ongoing communications and outreach efforts, the PMO was able to prepare personnel for the changes well in advance of actual implementation. As a result, adoption rates for the new wireless sourcing policies exceeded initial expectations and continue, even today, to increase.

It's worth noting that communications are most effective when accompanied by a "branding" effort to create a unique, recognizable and positive identity for the program. At its most basic level, this may consist of creating a distinctive program name, logo and perhaps even a tagline. Embedded in the brand identity and carried through the program's messaging should be the "promise" of the program and the benefits it can deliver.

Principle 5: Use Policy as Carrot, Not Stick

Policy is what many programs fall back on when they've failed to secure stakeholder buy-in and participation along the way. In essence, they default to a "do it because the rules say so" approach—a tendency to mandate change through rules and regulations without more comprehensive change management efforts to encourage and support new behaviors. (That has been particularly true in the federal government, although it is less so now than in past decades.)

For example, one federal agency recently introduced new review requirements for complex service procurements. Any service procurement above a certain spend threshold needed to undergo additional review prior to approval. To get around the policy, service purchasers began breaking up large service procurements into smaller chunks, thereby avoiding the review process.

That said, policy certainly has a place in supporting major supply management initiatives. But in most cases, it is best used for positive reinforcement of changes that are introduced more organically through change management efforts. The idea should be to develop thoughtful policies that support but don't drive change management and implementation efforts.

On one recent sourcing initiative related to maintenance equipment, our firm engaged stakeholders early in the process to understand the key issues and challenges they faced and the outcomes that would allow them to efficiently execute their functions. After developing and executing a strategy to address these stakeholder needs, we then launched a communication campaign that tied the program's benefits back to the issues and challenges stakeholders had originally shared with us. While policy was definitely one of the supplementary compliance strategies we used, communicating program benefits were the primary means

through which we were able to build buy-in and increase stakeholder participation.

Principle 6: Create Communities

One of the challenges that large global organizations face is how to create the kind of "learning environment" that enables best practices developed in one part of the organization to be shared and replicated across the enterprise.

The idea is to build networks across the enterprise to create value that transcends the immediate program objectives. Stakeholder engagement efforts during an enterprise-wide supply management initiative help fulfill this idea. Not only do they support the successful execution of the supply management program but they also help build formal and informal networks of individuals who have related functions, needs, and interests. Such communities can be extremely beneficial for fostering sustainable, long-term program results and for strengthening organizational performance as a whole. Additionally, they help build goodwill for the program that facilitated the process.

Recently, we led a large strategic sourcing program to streamline the way that the U.S. government purchases and manages express parcel delivery services. Through facilitated sessions, we brought together dozens of individuals from more than 10 large federal agencies to help develop the sourcing requirements and strategies. What we didn't anticipate was that these individuals would continue to communicate and share knowledge with one another beyond these early program development exercises. Through this network, people are now talking about other cost savings opportunities such as shipping optimization and process improvement—and creating even more value in the area of delivery service sourcing.

Insuring Success

Organizations that invest in enterprise-wide supply management programs do so because they recognize the significant payoff that can result in terms of efficiency, cost savings and quality improvements. But those organizations that focus exclusively on the technical and strategic aspects of their initiatives—and fail to factor in the importance of stakeholder engagement—put their programs and their investments at risk. Ultimately, program success is contingent upon the participation of people throughout the enterprise who share the program's vision and believe in its benefits.

By following the six principles laid out in this article, managers of complex, large-scale supply management programs can ensure that stakeholder engagement is a conscious and integrated element throughout the program effort. It's an additional investment, to be sure. But it's also the best insurance for implementation success.

The term '**stakeholder**' is increasingly used in discussions on planning, public policy and governance. Used in this context, 'stakeholder' refers to social groups or institutions that have an interest in the policy or planning questions under discussion.

If, by 'stakeholder', we include all those persons, communities and organizations that have a necessary and legitimate interest1 in the outcome then we can also say that another way of identifying these is to call them '**interest groups'**.

In many languages the expression used to signify what we mean by 'stakeholder' is the equivalent of ‘interest group’ and we can consider ‘stakeholder’ and ‘interest group’ to be synonymous.

Stakeholders may have an interest in the NBSAP for a number of reasons:

- They have a direct legal or administrative responsibility for aspects of biodiversity, for example, the ministry of environment; the national environment agency; agencies responsible for forests, water resources, or coastal management; the national patent office or intellectual property agency (for ABS-related matters).
- Activities they carry out may have an impact on biodiversity, for example, agencies with responsibility for agriculture, transport, forestry, regional planning, or urban development.
- Measures and policies adopted under the NBSAP may have an impact on their own work. For example, environmental impact assessment requirements will affect the way an energy ministry plans for and licences new energy generation projects or the way the transport ministry or highway agencies plan and licence projects.
- They may be affected, directly or indirectly, in positive or negative ways, by the outcomes of the policy and planning decisions taken. For example, establishing protected areas under the NBSAP will have consequences for the population living in or around these areas; measures to make biodiversity use sustainable will impact on those communities whose livelihoods are derived from the (currently unsustainable) use of such resources.
- They may possess experience, knowledge and/or expertise that is relevant to biodiversity and that can assist the NBSAP to obtain better outcomes or avoid negative outcomes. It is important to involve all those who have knowledge and expertise of the issue, without distinction. The knowledge held by research institutions, public and private, and that held by those communities – indigenous. This means those who are directly or indirectly affected; it does not necessarily include those who may be 'interested' in the issue, but will not necessarily be affected (examples might be academic researchers, journalists or others). Traditional, farming, fishing and so on – who deal with the issue as part of their livelihoods, are equally important.
- They have a legitimate interest in the issue and thus an entitlement to be consulted on and to participate in the decision-making process. An individual's or a community's entitlement to information on plans and proposals that may affect them and to participate in the process of decision making is a cornerstone of democratic governance. This principle is enshrined in the Rio Declaration on Environment and Development adopted at the Earth Summit in 1992 and in an increasing number of global and regional environmental treaties.

Undertaking identification and invitation

The essential point is that there can be no pre-determined list of who the stakeholders are in any particular case. The examples above are just that – examples. In each specific case in individual national contexts, the identification of the stakeholders will result in different lists. This is as it should be, as each country has different sets of institutions, different legal and administrative arrangements, different traditions and forms of participation – not to mention different biodiversity.

Each national manager responsible for NBSAP development and each national steering committee will need to use flexibility and creativity to identify the stakeholders for each topic in accordance with national circumstances.

This calls for consultation, since no individual official and probably no individual department will have a complete and reliable overview of who the national stakeholders are likely to be. This is one of the reasons for attempting to start the process with a steering committee that is as broad-based as possible. **The more sectors represented on the steering committee, the greater will be its ability to pool information and therefore the likelihood of correctly identified the full set of stakeholders.**

In some circumstances, this may require breaking with existing habits or perceptions. It may for example require establishing contacts where none currently exist, involving habitually marginal communities or local administrations in opposition to the national government.

It is important that all sectors, regions and social categories that have an interest in the issue under review are invited to participate in the development and implementation of the NBSAP.

4. When should the different categories of stakeholders be brought into the NBSAP process?

Two-stage process?

The first phase of NBSAP preparation covers stocktaking and assessment, and definition of initial priorities and objectives of the strategy. In this first phase some countries may feel it more appropriate to involve only those stakeholders directly involved – the so-called ‘biodiversity community’.

Such a decision may permit a tighter focus on the scientific and social assessment aspects of NBSAP development and on the identification of its priorities and objectives in the initial stages of the process. However, the need for ownership of the strategy by all stakeholders implies the risk that those potential stakeholders not included from the very beginning may feel excluded and reluctant to fully participate when subsequently invited.

There is a common sense issue here. If you think the outcome of your stocktaking and review will involve convincing other actors to accept your analysis and recommendations, and thereby to modify their behaviour and practices, it is sensible to involve them from the beginning. This is not just a question of participative democratic principle, but of ensuring that the process arrives at the best outcome by the most efficient means.

All at once?

The scope of initial participation may have an impact on the dynamics and efficiency of the process. There are advantages and disadvantages to broadening the participation right from the beginning. There are risks in not doing so.

The argument for putting off the active involvement of some sets of stakeholders to a second stage is that their engagement in the issue is less direct than the first group of invitees. By following this argument however the NBSAP committee may create two problems for itself:

- the possibly negative feelings of those brought in late may have to be appeased, and
- the belated realization that the 'second wave' of participants possess views and experience that were not available from the beginning and that now mean adjustments to the policy proposals have to be made. In this case it would have been more efficient to have avoided this risk, and to have got all the information and viewpoints on the table at the earliest opportunity.

Ultimately these decisions of timing can only be taken at the national level by the NBSAP managers and the committee.

Implementation and updating

Whatever strategy is adopted for involving stakeholders in its development, the implementation phase of the NBSAP will inevitably see the increasing engagement of stakeholders of all categories. Identifying and monitoring national biodiversity will be impossible without the involvement of universities and scientific bodies. The conservation and sustainable use of agricultural biodiversity will require the active participation of a wide range of actors (see box 2).

Each component of the NBSAP will probably generate its own set of stakeholders, as its influence consolidates and expands – thematically and geographically. The questions that need to be constantly asked are 'who are the stakeholders for this issue?' and 'who needs to be involved in this region or biome?'

By the time the first version of the NBSAP is ready to be updated, there should be an extensive network of stakeholders involved in the implementation of each element of the NBSAP. It will be, in large part, their experience of implementation and their views on adaptations that need to be made that will provide the inputs to the updating of the NBSAP.

It is therefore extremely important to ensure that there are forums and mechanisms for sharing and systematizing the experiences of implementation and that the network of stakeholders is fully involved in the NBSAP revision process.

5. What are possible mechanisms for involving stakeholders?

The need to involve the widest range of stakeholders in the HENVINET process raises the question of how to go about this. What are the possible mechanisms? What are the procedures and formats that will ensure the most effective dynamics and the best outcomes of the preparation stages?

There are no hard and fast answers to these questions – no universal, one-size-fits-all solution. To start with, the options will vary in accordance with the size,

structure and traditions of the country itself. The best way of arranging things in the case of a small island state will probably not apply to a large federal state, for example.

One obvious recommendation to make is that those involved in getting the HENVINET process off the ground should not try to re-invent the wheel. If the country already has consultation procedures for public policy discussions in place or if there are existing forums for broad based discussion of environmental or development policy, then a sensible decision will be to build on these examples – using the same structures, or establishing a new structure modelled on procedures that have been proved to work in the national context.

However, if there are no previous national models, or if those that exist are felt to be inadequate or inappropriate, then new arrangements will need to be decided upon.

Answers to the question 'what are the possible mechanisms for involving stakeholders?' will come in two parts. First, what are the possible formats? Second, what are the best techniques to be used in the consultation and policy development discussions to ensure full participation in and ownership of the outcomes?

Possible formats

Workshops

This is the format that is most likely to be decided by geographical and cultural factors. In a small country it may be that all potential stakeholders can be easily identified because they are already visible within national policy discussions on the issues to be addressed in the HENVINET process. Bringing such stakeholders together in national biodiversity planning workshops or development sessions in the national capital may be logistically easy and cost-effective.

In the case of large countries, especially those with federal structures or strong sub-national authorities, many of these have opted for one or more series of NBSAP workshops at state or provincial levels, leading to national meetings. This is often the most cost-effective way of involving the largest number of participants in the process and ensuring that the strategy development process is informed to the fullest extent possible by the experiences and demands of stakeholders throughout the national territory. The national meetings will then serve to synthesise and structure the local experiences and recommendations into a national policy framework.

The same logic also applies to arrangements that involve sectoral consultations that are then brought together into an overall national strategy framework. In this case, initial workshops for different sectors or stakeholder categories – for example, the scientific community, indigenous groups, the private sector, the agricultural sector – could be arranged (at either national or sub-national levels, depending on national circumstances), and the outcomes of these consultations would flow into the national level synthesis.

In an ideal situation, the best arrangements might be to have all three sets of consultations: local, sectoral and national. However these sorts of decision will need to be taken by the NBSAP managers and/or committee in light of a series of

factors: national circumstances, human and institutional resources, financial resources and the time allowed for the process.

E-conferences

A further possibility, if feasible within national circumstances, is to organise internet or email based consultations ('e-conferences'). However, these should only be organised if a significant and representative proportion of potential stakeholders would be able to participate. If, for example, only urban stakeholders have e-mail access, or if indigenous and traditional communities are unfamiliar with or have poor access to the necessary technology, then this option should be approached with caution, as it may result in unequal participation by some stakeholder groups.

Where e-conferences and other electronic options are used, they should be seen as a complement to, and not a substitute for, workshops and other live, face-to-face interactions.

Possible techniques

As important as the decisions on format, are the decisions to be taken on the methodologies. It is important that all stakeholders participating in the NBSAP process are made to feel comfortable that they are equal partners in the process, that their experience and knowledge is important, and that their views will be considered on an equal basis.

Instilling this level of comfort, which is essential for generating the overall desired outcome of a shared sense of ownership of the process by all stakeholders, is no easy task. It may involve breaking with tradition and ingrained habits, for example by thinking about how to really promote interactive roundtable discussions and not fall into the trap of organising a lecture series, where 'experts' talk from the podium to a room full of passive 'listeners'.

Request for side-event at Ministerial conference on Health and Environment in Parma, Italy, March 2010

Health and Environment Networking Portal

Purpose

The purpose is to connect participants to the HENVINET Health and Environment networking portal. A professional network of scientists and policy makers is forming on the portal which has been generated through the HENVINET project. The exchange of scientific information and the way environmental health problems are identified/tackled comprise the main content of the web-based portal. It is a meeting place for those professionals working in the field of health and environment. Registered participants can start their own discussion or topic group and can find specialists for meetings or projects.

Brief description

HENVINET project
At several breaks, a stand will be manned and equipped with laptops demonstrating the portal of HENVINET. All conference participants are invited to see a demonstration of the portal and to register on the spot if so desired.

Organizer
HENVINET 6th Framework EU project

Affiliation
Coordinator: NILU – Norwegian Institute for Air Research

Address: NILU, Pb 100, 2027 Kjeller, NORWAY

Tel. +47 63 89 80 00

Email: aba@nilu.no

Special requirements

TV screen/LCD screen, table/chairs, two poster boards

HENVINET project leaflet

WHAT IS HENVINET

HENVINET is funded by the EU 6th Framework Programme involving 32 partners from 18 countries, including five countries outside Europe. The main objective of the project is to establish long-term cooperation between researchers, policy makers and other stakeholders in the area of environment and health research. This cooperation aims to support the development of integrated health and environment policies throughout Europe and the rest of the world.

HENVINET focuses currently on the four priority health issues defined by the European Environment and Health Action Plan (EHAP) 2004-2010:

- Asthma and allergies
- Cancer
- Neurodevelopmental disorders
- Endocrine disruptors

HENVINET is reviewing and validating research results and decision-support tools, and will provide resources that can be utilized by a wide range of professionals working in the fields of environment and health.

HENVINET OBJECTIVES

- Evaluation of knowledge on environmental causes related to the relevant health end points;
- Evaluation of Decision Support Tools (DSTs) related to the health end points. DSTs include models, software, methodologies and data on environmental stressors, emissions, their dispersion in the environment and pathways to humans, behaviour and exposure of population, and final health effects;
- Creation of a web-based portal supporting science-policy-interface.

WHAT HAS HENVINET ACHIEVED SO FAR

- Methodology for evaluating existing knowledge within the HENVINET thematic areas
- Review of the scientific basis for the relationships between environment and selected health end points
- Preparation of a tool for stakeholder knowledge evaluation
- Stakeholder analysis of environment and health priorities, as well as assessments of research needs
- Collection of information on relevant decision support tools, or "tools for practitioners", with the inclusion of evaluation criteria. 80 tools have been identified to date and are accessible via a web based searchable database
- Development of the design and framework for a networking portal for Environment and Health professionals.

LOOKING FORWARD

The ongoing work on HENVINET includes:

- Scientific work: reviews of the scientific basis for health concerns with environmental contributions
- Delivery of related publications (e.g. journals, web, etc)
- Knowledge evaluations by relevant stakeholders
- Support to practitioners: collection and evaluation of information about tools for practitioners
- Networking portal: development of an Environment and Health online network based on dialogue with the relevant professional stakeholders

"YES" TO ANY OF THE FOLLOWING? PARTICIPATE IN HENVINET!

- Are you a policymaker, scientist, researcher, advisor, practitioner, or a specialist working in the health and environment field?
- Do you wish to expand your knowledge and network in the environment and health research arena?
- Are you a stakeholder at the national level such as the environment and health agencies, the National Institutes of Public Health or from an environmental health monitoring agency?
- Are you working with ongoing projects in the field of environment and health?
- Is your organisation specifically focusing on one of the themes of HENVINET?

HENVINET ASSISTS PROFESSIONALS

We provide:

- Tools to support stakeholders' decision making.
- Methods for evaluating gap of knowledge within the four HENVINET thematic areas.
- A networking portal with a range of tools for locating and accessing expertise, sharing knowledge, views and networking with peers in the global Environment and Health community.

HOW TO PARTICIPATE

- Go to our networking portal (http://www.henvinet.eu), register and start networking with experts in the health and environment community.
- Go to our project webpage (http://henvinet.nilu.no), register and explore the HENVINET Tools:
  - Evaluation of knowledge
  - Decision Support Tools

Note: The webpages require separate registrations.

PARTICIPATING ORGANIZATIONS

- Norwegian Institute for Air Research (NILU)
- National Veterinary Institute (NVI)
- The Ecobaby Foundation
- University Hospitals Bristol NHS Foundation Trust
- Public Health Services Gelderland Midden
- Food and Environment Research Agency
- Slovak Medical University
- Institute of Food Bioresources (IBA)
- Italian National Agency for New Technologies, Energy and the Environment (ENEA)
- World Health Organization (WHO) – European Centre for Environment and Health
- University of Hertfordshire
- Netherlands Organisation for Applied Scientific Research (TNO)
- Finnish Meteorological Institute (FMI)
- Directorate General Joint Research Centre (JRC)
- Piemonte Region
- Institute for Medical Research and Occupational Health
- Umeå University
- Slovak Technical University
- Norwegian School of Veterinary Science (NVH)
- Stockholm University
- University of Southern Denmark
- Wageningen University
- National Centre for Scientific Research "Demokritos"
- University of Oslo
- Argentinean Association of Doctors for the Environment (AAMMA),
- Peking University School of Public Health
- Integral University
- National Cancer Research Institute, Genova
- eThekwini Municipality
- National Institute for Public Health of Mexico (INSP)
- National Institute of Health (ISS)
- University of Antwerp

FOR MORE INFORMATION PLEASE VISIT OUR WEBSITE: HENVINET.NILU.NO

CONNECTING ENVIRONMENT AND HEALTH PROFESSIONALS

HENVINET is a coordination action funded under the EU 6th Framework Programme, activity SUSTDEV-2005-3.VII.2.1 (2006-2010).

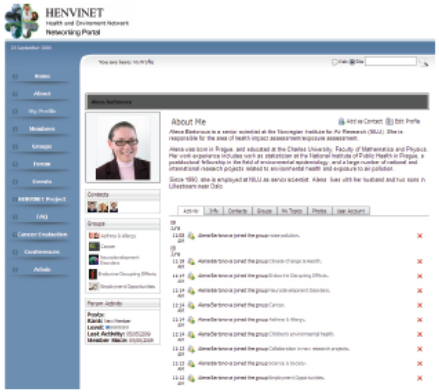
CONTACT: Project.coordinator@henvinet.eu

Dated: 26.06.09

HENVINET
HEALTH AND ENVIRONMENT NETWORK

HENVINET portal leaflet

TYPICAL PORTAL PROFILE



Join the HENVINET networking community in three easy steps:

1) Register at www.henvinet.eu
2) Create your profile
3) Participate and network

HENVINET PROJECT

The portal is a product of the HENVINET project, a cooperation of 27 European and 5 partners outside Europe. The project offers also other products, including examples of knowledge evaluation methodology for environmental health issues, and a metadatabase of tools to support decision making. They are accessible from the portal directly or through the project web pages.

Support the Environment and Health practice

A database is available for you to search for existing decision support tools related to broad or specific risk assessment methods. You can also make your tool available to others by creating your tool record.

A set of descriptors complements free text, and simplifies your search for suitable practical approaches to your environmental health problem.

HENVINET is a coordination action funded under the EU 6th Framework Programme, activity SUSTDEV-2005-3.VII.2.1 (2006-2010).

CONTACT:
Project.coordinator@henvinet.eu

Dated: 28.09.09

The HENVINET Networking Portal

Connecting Environment and Health Professionals

WHAT IS THE HENVINET NETWORKING PORTAL?

HENVINET offers a powerful online networking portal designed specifically for the global environment and health community.

Based on a range of tools for locating and accessing expertise, sharing knowledge, and networking with peers, the HENVINET portal empowers a multi-stakeholder approach to the most pressing environment and health issues evident today.

Go to **http://www.henvinet.eu** to register;
go online and participate!

HENVINET
HEALTH AND ENVIRONMENT NETWORK

The HENVINET portal provides environment and health professionals and stakeholders throughout the world with the ability to:

Network with peers:
Engage with a community of scientists, policymakers and other stakeholders to share expertise, views and information.

Access the experts:
Search for and pinpoint specific expertise, and efficiently communicate and discuss concerns and specific topics with experts worldwide.

Tackle global challenges:
Collaborate within stakeholder communities via online forums that bring together a relevant portfolio of experts and stakeholders to address global challenges.

Set the agenda:
Shape the agenda of the Environment and Health community via participation in forums that discuss the key topics of today and tomorrow.

Share opportunities:
Advertise conferences, symposia, research calls, employment offers and similar opportunities to a wide range of professionals.

HENVINET PORTAL PARTICIPATION

- Register as a user
- Add your profile information
- Join relevant groups
- Find relevant contacts
- Initiate and discuss issues via the various forums

PORTAL FUNCTIONALITIES

Member Profile

Your page for professional and biographic information where you can also post statements, documents, images, links, and RSS feeds to share with your contacts. Your page organizes all your contacts within the PORTAL network, and displays the PORTAL groups you are linked to.

Groups

Join groups relevant to your professional areas of interest and begin networking with others in your field. Via groups you can receive information and updates for your areas of interest, and post messages to others.

Contacts

Find existing registered contacts and search the members' lists for new contacts based on geographical region or interest area. Invite new members to be your contacts and begin sharing information, discussing issues, and networking.

Forum

Discussion forums are the place to ask questions, find answers, discuss problems, and post statements about specific issues. Forums are organized according to the various groups of the portal.

Events

Add, view, and comment on upcoming events in the environment and health field.

News

Stay informed on recent important news items throughout the world, as well as happening on the portal forums.

ISSUES THAT THE PORTAL CAN ADDRESS

Do you have a local policy issue that you would like to present to an international forum?

Post a message on the discussion forum or within a group.

Do you want to discuss the impact of your study with international colleagues?

Join a group or participate in a discussion forum.

Are you involved in research and are looking for new partners?

Join a relevant group and begin networking with members.

Do you want to share information about conferences or job opportunities?

Place an announcement on the forum or within a particular group.

Do you wish to expand your professional network and have more contacts in your field?

Make new contacts from the members list.

Do you wish to profile yourself or your organization to others internationally?

Create an attractive profile and begin interacting with members.

Do you want a place to share your publications, reports and documents?

Update your profile by uploading your publications and documents.

HENVINET portal fact and figures

HENVINET:

Health&Environment Networking Portal
Facts and Figures

Introduction:

The HENVINET project developed concrete tools to support decision making and identify knowledge gaps for specific H&E topics. A common interface (the HENVINET portal) was developed to present these tools and to facilitate communication for increased interaction and discussion within selected H&E topics, as well as the entire H&E field. The community established within the portal includes contributions from scientists and researchers, for the primary benefit of policymakers.

The statistics were collected with Google Analytics and are from the period of 01.12.2009 – 01.04.2010.

Facts

The networking portal has slowly increased in the number of members and contribution from its users. Currently, there are 297 members, and the number is increasing daily.

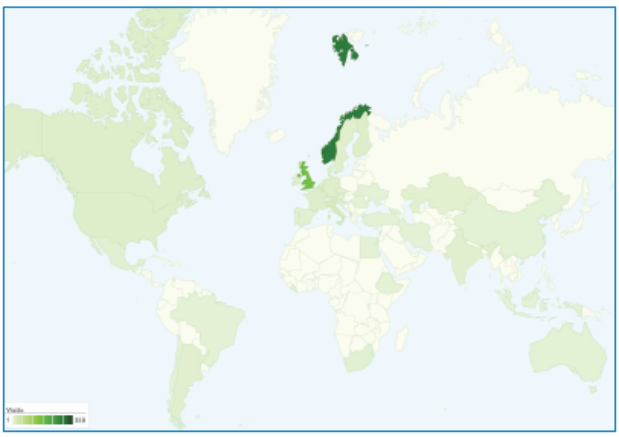


Figure 1: 748 visits from 45 countries, with the majority from Europe (Norway and UK) and North America (Canada and USA). Among them were 373 unique visitors.

Table 2: The top main areas of interest among the portal members

Area of Interest	
Public Health	23
Air Quality	20
Child Health	16
Exposure assessment	13
Epidemiology	12
Toxicology	11
Endocrine Disrupting Effects	10
Climate Change Effects	9
Asthma&Allergy	8
Occupational Health&Safety	8
Pesticides	8
Impact Assessment	6
Pollutants	6

Table 1: An overview of the active groups

Group Name	Members
Aphekom and other friends	4
Asthma And Allergy	25
Cancer	25
Chemicals In Products (CIP)	9
Children's environmental health	50
Climate Change & Health	35
Collaboration in new research projects	37
Decision Support Tools	19
E.C.H.E	1
Employment Opportunities	22
Endocrine Disrupting Effects	20
Environmental Chemistry	6
Friends of INTARESE	8
Friends of PRONET	3
Human Biomonitoring	17
Journal articles in WP 1 Henvinet	10
Nanoparticles	25
Neurodevelopment Disorders	20
Noise pollution	11
Non Exhaust Emissions	14
Portal Testing and Status	23
Science & Society	33
Transport induced air pollution	25
Uncertainty in science for policy	9
Water quality and management	12
Young Scientists	14

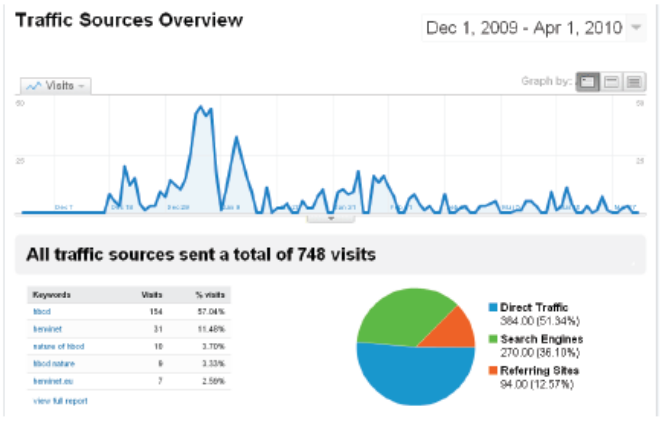


Figure 2: 12,57% of the user traffic is due to referring sites such as HEIMTSA and INCHES network, whereas over 36% is due to keyword searches related to HBCD.

Funding: HENVINET is funded by the EU 6th framework programme. EU FP6 contract no. 037019, area SUSTDEV-2005-3.VII.2.1

PP 06 2010 AY

HENVINET Decision Support Tools leaflet

A Typical DST in the MDB

The DST Search Engine

HENVINET PROJECT

The MDB is a product of the HENVINET project, a cooperation of 27 European and 5 partners outside Europe. The project offers also other products, including examples of knowledge evaluation methodology for environmental health issues, and a powerful online networking portal designed specifically for the global environment and the health community.

The MDB is accessible from the following web pages:

HENVINET networking portal: www.henvinet.eu

or through the project web pages:

http://henvinet.nilu.no

HENVINET is a coordination action funded under the EU 6th Framework Programme, activity SUSTDEV-2005-3.VII.2.1 (2006-2010).

CONTACT:
Project.coordinator@henvinet.eu

Dated: 15.02.10

HENVINET
Decision Support Tools

Connecting Environment and Health Professionals

WHAT ARE THE HENVINET DECISION SUPPORT TOOLS?

HENVINET has identified a variety of tools to be used in a number of different decision making contexts: from every day operation by health practitioners to strategic long term planning of policies for reducing the negative effects of environment on health. Such tools include software models, guidelines, handbooks, or simple indicators.

Over 100 Decision Support Tools (DSTs) have been identified so far and are accessible through a web-based searchable Meta Database (MDB).

HENVINET
HEALTH AND ENVIRONMENT NETWORK

The HENVINET Meta Database (MDB) is available for you to search for existing decision support tools related to broad or specific risk assessment methods. A set of descriptors complements free text, and simplifies your search for suitable practical approaches to your environmental health problem.

Thematic Areas:

The following aspects are described in the DSTs: sources of stressors, population behaviour, dispersion processes, exposure of population, intake, fate of compounds in the body, health end points.

Types of stressors:

The major categories of environmental stressors considered in the DSTs where most frequent types are: Behavioural, Biological, Chemical, and Physical.

Specific Stressors:

Relatively detailed categories of stressors as identified in Environment & Health literature, such as: Ozone, Particulate Matter, Pesticides, Pharmaceuticals, Radon and Sulphates.

Evaluation Criterias:

Six criterias that HENVINET partners selected to give a synthetic but meaningful idea of DST usability. These are: user friendliness, causal chain approach coverage, robustness, user application history, applicability and uncertainty.

Each criterion is assigned three qualitative scores.

MDB functionalities

The HENVINET MDB offers the following functionalities: add information on new tools, searching info on available DSTs, provide reviews and comments.

Adding a DST:

In order to upload a DST, registration is required. An online General Guideline is provided for new users.

Editing an existing DST:

Only the provider of the given DST is allowed to edit the already uploaded info.

Review and comment

Each DST has a free text space for providing comments of any kind that can contribute to the improvement of the tool or to improve the description within the database.

Search engine:

Two search options are available:

1) Free text search by using keywords of your interest.

2) Advanced search by different categories, which is fixed. Choose several keywords within one category by holding down the Ctrl button.

Usage of the DSTs

HENVINET Decision Support Tools can be used in a variety of decision making contexts, from the basic every day actions of health professionals dealing with issues raised by environmental stressors, to strategic long term planning of actions and policies at various administrative levels (European, National, Regional, Urban).

Decision Making Areas:

HENVINET DSTs recognise at least the following decision making contexts: Agriculture, Air Quality Management, Food Quality, Land Use, Mobility and Transport, Public Health, Urban Planning, Waste Management, Water Resources Management.

DSTs expected users

Four major categories of potential users of HENVINET DSTs have been identified: Administrators, Environment Professionals, Health Professionals, Researchers.

Other aspects of DSTs usage

The MDB also provides information on three relevant issues in the 'usability' of HENVINET DSTs: details on how it was used in the past, the ways in which the uncertainty has been tackled, and the requirements needed for data input.

HENVINET policy brief-CPF

HENVINET Policy Brief:

Expert Elicitation on Neurodevelopmental Implications of CPF

Policy context

- Chlorpyrifos (CPF) is an organophosphate pesticide used in Europe for outdoor and indoor pest control. A ban on residential use of CPF has been in effect in the US since 2001 but the EU has no such restrictions.
- In 2003 organophosphates accounted for over 59% of insecticide sales in the EU, with CPF the top selling insecticide.
- Organophosphate compounds act by inhibiting acetylcholinesterase (AChE), which affects nerve function in insects, humans and other animals.
- There are concerns about the safety of CPF in indoor settings. While previous studies have shown levels of CPF that are safe in adults, recent animal studies show the young may be more sensitive to toxicity. It affects synaptic transmission in neurons, which can lead to developmental and behavioural problems. It may affect children on a large scale and may be a contributing factor related to the large scale of emotional and behavioural diagnoses in Europe.
- Such effects, combined with those of other neurotoxic industrial chemicals, could lead to a 'silent pandemic' of pervasive, nonspecific developmental disorders that might affect a large proportion of the population.

Policy options

The prior consideration and rejection of an indoor use ban for CPF twice before, in 2002 and 2008, raises the question of what impact current knowledge assessment may have on future policy options.

More data and better understanding were indicated as tasks for science to address in the next five years. Funding for fundamental science focussing on population behaviour and physical processes is of high importance. For applied science, developing interventions in these areas was favoured.

EU-level monitoring of population behaviour, physical processes, dispersion and transfer is supported by scientists. Awareness raising of possible risks due to population behaviour was also indicated. One of the experts felt strongly that there is enough information available to enact prohibitory policies immediately with an eye towards altering usage of the products in homes, with a ban on home use considered to have the most direct effect on outcomes. Once this was in place it was then suggested that science and policy might then turn to the question of whether agricultural applications were also safe.

Confidence that these suggestions could be achieved in the scientific realm over the next five years were medium and high. Confidence that policy could achieve these in the next five years ranged between low and very high.

Executive summary

Preventing potential adverse effects on human health caused by CPF is a task for authorities around the world. Taking appropriate political actions requires knowledge on the outcome of indoor exposure. How much is needed to support policy measures is open for debate amongst experts, policymakers and stakeholders.

Two questionnaires were distributed for input from published experts in this field. An initial expert questionnaire was deployed in order to evaluate the state of the current scientific knowledge and highlight important policy considerations. Of 35 potential contributors identified, 8 were able to complete the online questionnaire.

- In light of current, albeit limited, knowledge available on the risks of CPF, most favour a precautionary ban or restrictions on its use.
- Most agree more research and monitoring is needed to develop better understanding of the risks involved in the use of CPF.

Respondents were asked to complete a second questionnaire and take part in an expert panel workshop where the results were discussed. Of the 8, two were available for the workshop. Priorities for further action were identified.

First Questionnaire

A causal diagram illustrating scientists' current understanding of the cause-effect relationship between use of CPF and its impact on health was made. The diagram was based on the latest review articles and reports available. Experts have all published research studies on the subject. They were asked to express their confidence in the current knowledge by completing an online questionnaire.

Questions related both to specific areas of the diagram and to the structure of the diagram overall. In addition, experts were asked to assess their feelings regarding whether there was enough scientific knowledge to justify a restriction on uses of CPF.

The following shows example questions where there were high levels of disagreement between experts:

Response Scale

- Very High
- High
- Medium
- Low
- Very Low

What is your level of confidence in:

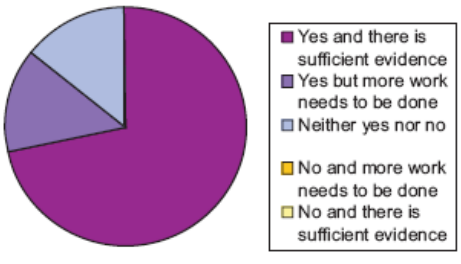
the ability to predict sex-specific health effects in experimental animals?

the ability to predict CPF has the potential to cause detrimental health effects?

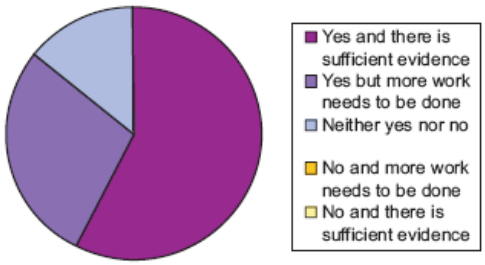
the knowledge of the mechanism(s) of action of CPF and its metabolites?

There were also areas of high agreement. Experts considered the quality of evidence for a clear risk, results of which varied from very high confidence to very low. Many felt more research was necessary to quantify the risk. However, when asked whether CPF should be banned from home use, the majority agreed.

None of the experts chose the 'No, and more work needs to be done' or 'No, and there is sufficient evidence' options. When asked if CPF should be banned due to specific neurodevelopmental effects, again the majority agreed.



The results for the question whether CPF should be banned from home use.



The results for the question whether CPF should be banned due to specific neurodevelopmental effects.

Second Questionnaire and Workshop

An expert consultation and second questionnaire on policy action followed the first questionnaire. Two respondents attended the workshop along with a social scientist and a consortium moderator. The participants represented the farthest ends of the continuum from the first questionnaire. The depth of examination in such a group can help to identify areas of concern where perhaps a larger group would not be able to explore such issues.

Experts agree that the three priority areas to investigate are:

- Population behaviour, including occupation, diet, and at-home use,
- Physical processes, such as uptake or absorption, since these determine exposure, and
- Pathophysiological processes, like enzyme function, which determine exposure outcome

Pre- and post-natal exposures were considered important. Specific questioning for more detail revealed:

- 'Frequency and duration of exposure... affects health risks'
- 'Age and genetic polymorphisms influence toxicity'
- 'More research needed... in low doses of chlorpyrifos.'

More research was recommended regarding specific EU indoor exposures to CPF. It was also discussed whether CPF is the causal toxin or if it is a proxy in studies for some other exposure or behaviour. Merits of particular study designs were discussed.

It was felt both research and policy action can contribute to reducing problems. One scientist commented changes in policy were "feasible immediately". More data about exposure, better scientific understanding, and CPF monitoring were supported.

Further comments included 'I think CPF is fine for outdoor use...indoor use is of concern.' Another suggested 'strict evaluation of current use in... domestic settings.'

Recommendations

Areas of concern: Population behaviour and physical processes were considered the most important factors in toxicological outcome.

The arguments: There are limited data on effect at low, sub-toxic levels but also a request for more epidemiological evaluation of the risk issue. More focus in the future should be addressed on design of studies being appropriate to realistic exposures in the home that are suitable to the EU.

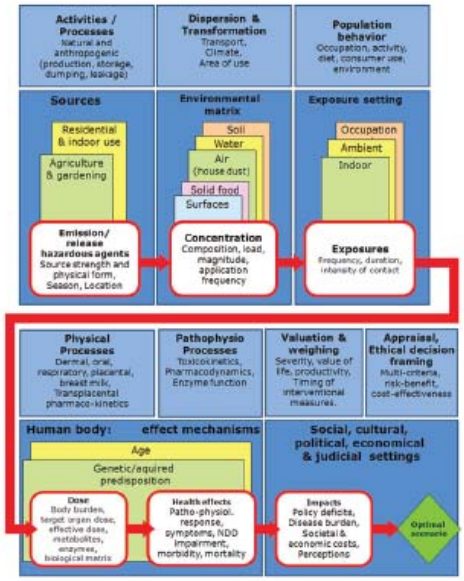


Figure 1. Diagram developed by HENVINET and used by experts to evaluate the current understanding of the cause-effect relationship between the production and use of CPF and its potential impact on health.

Type of action: Experts suggested more scientific research with focus on more data and better understanding of fundamental science. Also a request for policy action, especially more monitoring activities, but also some restricting and prohibiting activities.

Form of action: Research to determine whether factors influencing use of CPF in North America are applicable here, and whether exposure at a sub-clinical level has a measurable effect. Use policy to decrease or stop this exposure by raising awareness and restricting certain activities.

Confidence in science: Most experts have some confidence in science coming up with usable or decisive knowledge within the next five years.

Confidence in policy action: As indoor usage restrictions for CPF have been considered and rejected in the EU before, there were questions of whether policy makers could be motivated to examine the area further, but most felt policy could have a significant impact.

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HENVINET policy brief-Phthalates

HENVINET Policy Brief:

Expert Elicitation on Health Implications of Phthalates

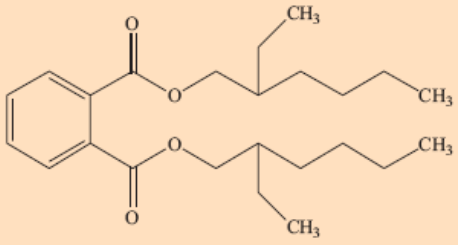
Policy context

- Phthalates are widely used in products as additives to PVC products such as food packaging, medical devices, solvents in cosmetics, insecticides and pharmaceuticals or construction materials.
- The major source for the general population is ingestion of food contaminated through production, processing and packaging. Other significant sources are indoor air exposure and cosmetics.
- Persons under intensive care and especially neonates are highly exposed via medical devices.
- Despite uncertainties and differences between various phthalates in respect to the toxicokinetic behaviour the concentrations in children are approximately two fold higher than in adults. Altogether a significant proportion of the population is continuously exposed to these compounds.
- Toxicological effects observed in animal studies include serious effects such as disruption of hormone levels and reproductive toxicity, foetal death, cancer, liver and kidney injuries.
- Phthalates can cross the placenta leading to exposure of the foetus that is followed in early life by exposure via the mother's milk.

Policy options

In order to evaluate the state of the current scientific knowledge and highlight important policy considerations, experts were approached by two questionnaires followed by a workshop (six experts). Based on the answers from the questionnaires and discussion at the workshop, it was concluded that:

- Experts disagree on whether or not the knowledge currently available is sufficient to justify policy action at this point. A majority of experts participating in the workshop feel that while phthalates are not persistent or bioaccumulative the continuous and daily exposure is leading to an exposure scenario that is in its practical effects similar to those with persistent and bioaccumulative compounds. According to this group of experts this is enough to justify a ban for the use in medical devices. One expert felt that more data are required before a decision to change the status quo is justified.
- There is limited knowledge on many aspects of the wide range of different phthalates, but the information available causes concern and speak in favour of more research. More end-user oriented research and monitoring should be funded in order to better understand the health risks.
- The experts selected three priority areas for which more knowledge will support better understanding:
  - The extent of intrauterine exposure in humans in the first trimester of pregnancy.
  - The extent and sources/processes of occupational exposure that will add to the already high oral exposure.
  - Toxicological data on proposed replacement products and the issue of mixture effects.
- More toxicological data should be required from industry. Also, research collaborations between independent institutions could be organised at the European level.
- Effort should also be put on research on potential alternative substances to phthalates.



The chemical structure of Bis(2-ethylhexyl)phthalate (DEHP).

Executive summary

Situation

Phthalates are a family of industrial chemicals, which have been used for a variety of purposes such as plasticisers that impart flexibility and durability to polyvinylchloride (PVC) products. They are also used in solvents, lubricating oils, fixatives and as detergents in personal care products. When incorporated into PVC, phthalates are not chemically bound and are therefore easily released into the environment consequently resulting in animal and human exposure (Kavlock et al., 2006).

Annually more than 3 million metric tons of phthalates are used globally, and because of the widespread use, ubiquitous and constant environmental presence exposure of humans, domestic animals and wildlife is virtually unavoidable. Uses of the various phthalates mainly depend on their molecular weight (MW). Higher MW di (2-ethylhexyl) phthalate (DEHP), di-isononyl phthalate (DiNP), and di-isodecyl phthalate (DiDP) are used in construction materials, and numerous PVC products including clothing (footwear, raincoats), food packaging, children's products (toys, grip bumpers), and medical devices. Relatively low MW phthalates such as di-methyl phthalate (DMP), di-ethyl phthalate (DEP), and di-n-butyl phthalate (DBP) tend to be used as solvents and in cosmetics, insecticides and pharmaceuticals, but are also used in PVC (Heudorf et al., 2007).

Background

In the general population the major source of human exposure is through ingestion of food contaminated through production, processing and packaging. Other significant sources are indoor air exposure and possibly via cosmetics. Humans may also be exposed to high doses of phthalates from medical devices during medical procedures such as blood transfusions and hemodialysis. Phthalates and their metabolites were detected in the indoor environment, consumer products, human urine, breast milk, and amniotic fluid (liquid that surrounds and is ingested by the unborn baby). Furthermore, phthalates are also able to cross the placenta, and foetal exposure is closely correlated with maternal exposure (Kavlock et al., 2006; Lyche et al., 2009).

Phthalate esters possess endocrine disrupting properties and exposures to high concentrations were shown to induce foetal death, cancer, malformations, liver and kidney injury and reproductive toxicity in animals (Hauser and Calafat, 2005; Lyche et al., 2009). In humans, particular concerns have been raised regarding adverse effects following exposure to phthalates during development. Phthalates cross from maternal blood into the developing foetus via placental transfer and into neonates via breast milk, and these exposures may affect the developing endocrine system, which is essential for diverse biological functions including, sexual development and reproductive functions in

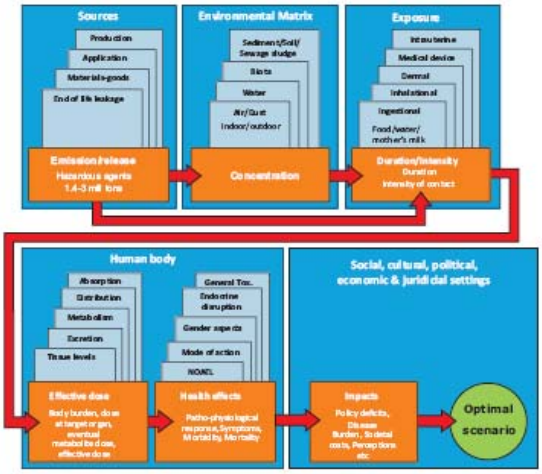


Figure 1. Cause-effect diagram for phthalates based on Lyche et al. (2009). The diagram was used by experts to evaluate the current understanding of the cause-effect relationship between the production and use of phthalates and its potential impact on health. The diagram has been slightly adapted to expert comments.

adults (Kavlock et al., 2006). The adverse effects observed in animals raise concerns as to whether exposure to phthalate esters in the environment represents a potential health risk to humans. The observed high sensitivity of the prenatal developmental stage for endocrine disruption has led to the postulation that increased incidence of human reproductive deficits may be produced by exposure to environmental chemicals during foetal and/or pre-pubertal life (Sharp and Skakkebaek, 2008).

To identify knowledge gaps and potential agreement or disagreement on the different aspects of the phthalates issue a causal diagram illustrating scientists' current understanding of the cause-effect relationship between the production and use of phthalates, especially DEHP and its potential impact in health was made (See Figure 1). The diagram was based on the latest review articles and reports available. A group of experts was asked to express their confidence in the current knowledge in the different parts of the diagram by completing an online questionnaire. From these experts a group of six was selected to complete a second questionnaire and take part in an expert panel workshop where the implications of the results of the two different evaluations for policy and health were discussed. Priorities for further action were identified and the workshop aimed at arriving at a final expert advice for policy makers.

Assessment

In developing an expert advice on phthalates for policy makers an important issue was prioritizing the elements of the

causal diagram with respect to public health risk. This was done in an expert workshop held in Copenhagen in May 2009; six experts participated in this workshop. The ambition was to set priorities for policy uptake.

The priority knowledge gaps

The top area issues that the expert work shop considered to be the most influential for the health impact of phthalates were identified:

- Intensive medical care especially of neonates is known to lead to uptake in patients far exceeding TDIs (Koch et al., 2006; Lyche et al., 2009) and there are already phthalate-free replacement products with identical properties for medical applications available (Pak et al., 2007). There is certainly a need for more research in these areas, also monitoring of levels in humans should be a tool to get a better overview of the exposure situation (Fromme et al., 2007).
- Intrauterine exposure was another important area that should be prioritized as this potentially leads to exposure during critical windows of development leading to life-long health effects (Latini et al., 2006; Mose et al., 2007.
- There is still too little knowledge on potential sources and the extent of occupational exposure in humans that will add to the uptake from food and dust that is already exceeding TDIs in a considerable part of the population (EFSA, 2005; Fromme et al., 2007).
- Mixtures need to be tested as for some phthalates cumulative effects on relevant endpoints such as testosterone production and testicular histopathology have been described (Lyche et al., 2009.

Toxicological health effects were also considered, as an important area to prioritize and pushing the use of alternatives where available. Spreading information on improper use of materials containing phthalates is another area that should get attention (Lyche et al., 2009).

Most experts in the work shop have medium to very high confidence in science coming up with usable or decisive knowledge within the next five years. Experts show medium to high confidence that policy actions to effectively manage the health risks of phthalates are to be technically (not necessarily politically) feasible either now, or will become so within the next five years.

Weight of knowledge

Arguments for using the precautionary principle to ban or restrict the use of phthalates would be the already high proportion of the general population exceeding TDIs combined with the uncertainties and potential threats in the "priority elements" as described above. The effects observed in animal studies involve reproductive development and hormone levels, which are serious effects (Lyche et al., 2009). There is also a risk that other effects appear at lower doses; further research is needed to investigate this. In that case the high environmental concentrations will have even more extensive consequences. Lessons from earlier used persistent compounds should favour precaution also for less persistent compounds where common exposure routes lead to an almost continuous exposure. For some uses, alternative compounds exist, which at least are less likely to leach out of the products they are used for.

On the other hand there are arguments against a ban. The industry may take into use compounds, which are less studied and not toxicologically tested at all. It may also be claimed the existing knowledge does not generate enough understanding to justify a ban, e.g. the current human toxicology data are insufficient to evaluate the prenatal and childhood effects following phthalate exposure.

In the panel of experts, 1 expert was against a ban whereas 5 were in favour of a ban.

Recommendations

Due to the fact that there are substantial gaps in knowledge in both phthalate levels of exposure and consequent health effects in humans, additional research is warranted.

1) It is of key importance to improve the knowledge of human toxicokinetics and toxicity, specifically during pregnancy and the nursing period, because in utero and early postnatal exposure appears to be the most vulnerable period during development.

2) Well-designed follow-up studies of reproductive system development and functions in the most heavily exposed and most vulnerable human populations may address the question of whether phthalates produce adverse human reproductive effects. Reproductive developmental toxicity is well studied in male animals. However, data on female reproductive toxicity are scarce and need further research. Further *in vitro* and *in vivo* studies are also warranted to improve the understanding of the modes of action of phthalates in humans.

3) Most studies focused on adverse reproductive and developmental effects associated with exposure to single phthalates. However, because humans are exposed to mixtures of phthalates both concurrently and sequentially, and available experimental evidence suggests that mixtures of phthalates may induce endocrine disruption in a cumulative fashion, it is necessary to initiate studies, which focus on mixture effects.

4) Phthalates should not be used in any medical device.

5) Despite the need for more knowledge on key issues regarding phthalates, most experts in our panel think that the weight of current knowledge legitimizes policy actions that will strongly reduce phthalates in our daily lives.

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HENVINET policy brief-HBCD

HENVINET Policy Brief:

Expert Elicitation on Health Implications of HBCD

Policy context

- HBCD is one of the major brominated flame retardants (BFRs) used today. BFRs are applied to prevent building materials, electronics, clothes and furniture from catching fire. The commercial formulation of HBCD contains three isomers: γ-HBCD, α-HBCD and β-HBCD.
- A sharp increase of the HBCD concentrations in the environment has been detected by several investigators since 2001, probably caused by the increased use of HBCD when other BFRs were banned or withdrawn (penta- and octabrominated diphenyl ether (PBDE) mixtures (Penta BDE, OctaBDE).
- The major concerns about HBCD are its persistence and its potential for bioaccumulation. The compound is found in high concentrations in both animals and nature.
- There are indications of toxicological effects of HBCD, especially in the liver and on the thyroid hormones. Also, once in the body, the different isomers of the technical mixture of HBCD are selectively metabolized. The α-HBCD isomer is metabolized at a slower rate and is accumulated to a greater extent in the body.
- On June 2nd 2009 the European Chemicals Agency (ECHA) within the REACH framework decided to restrict the use of HBCD within the EU such that it only can be used when "authorized" for specific purposes. HBCD is also currently proposed to be reviewed for a global agreement of restriction by the Stockholm Convention.
- Alternative substances to HBCD with putative lower risk have been proposed. Potential risks of these compounds are limited and further investigation is required.

Policy options

An expert workshop was conducted in order to evaluate the state of the current scientific knowledge and highlight important policy considerations.

Experts agreed that more information is needed about the HBCD compound in order to better understand its health impact. This requires more investment in fundamental science as well as certain policy measures such as monitoring activities.

Experts agreed to three priority areas for further investigation:

I. More knowledge, especially in humans, on the behavior of HBCD in the body, the mechanisms of action of HBCD and how HBCD may affect the health and illness of populations (toxicology and epidemiology).
II. More knowledge on the concentration levels of HBCD in the target tissues (absorption, distribution, metabolism and excretion of HBCD).
III. More knowledge on the extent of exposure to HBCD; especially human exposure and exposure to the general population.

Furthermore the following issues were proposed for better understanding:

I. The different behavior of the different HBCD stereo-isomers must also be addressed.
II. Effort should also be invested into research on the toxicity and environmental behaviour of the most frequently proposed alternatives to HBCD.
III. In order to accelerate the rate at which policy relevant information becomes available, experts feel that research collaborations between publically funded institutions should be organised at the European level.
IV. In addition to publically funded research, industry should be required to provide more toxicological data.
V. Policy makers must take decisions and invest more money in the required research.

Based on the answers from the questionnaire and discussion at the workshop, the invited experts were not in agreement on whether or not the knowledge currently available is sufficient to justify more strict policy actions at this point. While some experts considered the persistence and bioaccumulation properties of HBCD are enough to justify a ban or restrictions on use, others considered more data is required before a decision to change the status quo is justified.

Experts disagreed as to whether, given five years and adequate resources, additional research would yield decisive knowledge on the key issues related to HBCD and its alternatives. Experts had a medium to high degree of confidence in policy actions to effectively manage the health risks of HBCD to be technically (not necessarily politically) feasible either now, or within the next five years.

Executive summary

Situation

Brominated flame retardants (BFRs) are the major group of chemical flame retardants consisting of bromine containing organic compounds. BFRs are applied to prevent building materials, electronics, clothes and furniture from catching fire. Hexabromocyclododecane (HBCD or HBCDD) is one of the major BFRs. HBCD has 16 possible stereo-isomers with different biological activities, therefore the substance poses difficult problems for manufacturing, production and regulation [12]. The technical mixture/commercial formulation of HBCD contains three isomers: 75-89% γ-HBCD, 10-13% α-HBCD and 1-12% β-HBCD.

HBCD is used in construction and insulation boards, packaging material, electrical and electronic equipment, upholstered fabric and textiles, bed mattress, furniture, seatings, draperies, wall coverings, indoor textiles and automobile indoor textiles [12]. At present, according to BSEF, the brominated flame retardant industry panel, HBCD is the only suitable flame retardant for some of these applications.

The global production of HBCD was 16700 tons per year in 2001 and 23000 tons per year in 2008 [3]. This correlates well with a sharp increase of the HBCD concentrations in the environment detected by several investigators from 2001 onward [16], and is most probably caused by the increased use of HBCD when other BFRs were banned or withdrawed (penta- and octabrominated diphenyl ether (PBDE) mixtures (Penta BDE, OctaBDE). There is only one production site in Europe today, in the Netherlands.

HBCD's toxicity and harm to the environment is currently being discussed. The EU Risk Assessment (RA) of HBCD for environmental and human health was initiated in 1996 and finalized in 2008 [3,11,12]. The RA concluded that no risk to consumers was identified, and no risk for workers was identified when standard hygiene measures are applied. Further the RA concluded that HBCD has persistent, bioaccumulative and toxic (PBT) properties due to the reported increased environmental concentrations, the concerns linked to these higher concentrations, and the several specific risks identified in the aquatic environment. In June 2008 HBCD entered a screening procedure under the new legislation REACH [20]. On June 2nd 2009 the European Chemicals Agency (ECHA) within the REACH framework decided to restrict the use of HBCD within the EU such that it only can be used when "authorized" for specific purposes [9]. In Japan under the Chemical Substances Control Law (CSCL), HBCD was classified as a Type 1 Monitoring Chemical Substance since April 2004. The US Environmental Protection Agency (EPA) will finalize a review of HBCD in 2012. Canada will publish a risk assessment of HBCD during 2009. Furthermore, HBCD is currently proposed to be reviewed under the global framework of the Stockholm Convention on Persistent Organic Pollutants (POPs) [22]. HBCD is also included in the list of substances added to a proposal to revise the RoHS (Restriction of Hazardous Substances) directive [21].

Alternative substances to HBCD with putative lower risk have been proposed [10], but need further investigation. Among the proposed substances are: halogenated flame retardants in conjunction with antimony trixide, organic aryl phosphorous compounds, chlorinated paraffins, and ammonium polyphosphates.

Background

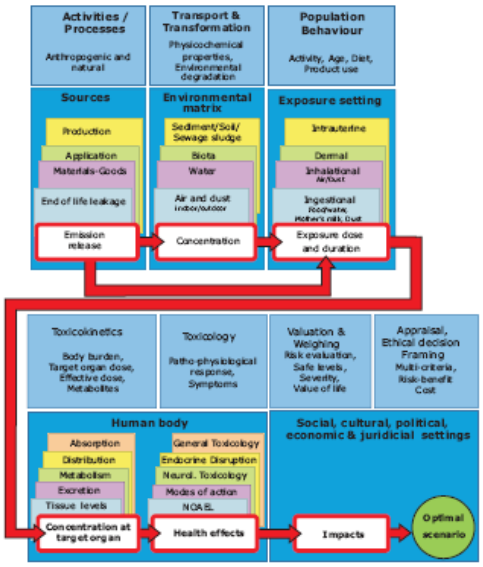

Figure 1. Diagram developed by HENVINET and used by expets to evaluate the current understanding of the cause-effect relationship between the production and use of HBCD and its potential impact on health. The diagram has been slightly adapted to comments from the experts.

HBCD is a ubiquitous contaminant in the environment, wildlife and humans due to widespread use, low volatility and low water solubility [6]. HBCD can be found in environmental samples such as birds, mammals, fish and other aquatic organisms as well as soil and sediment, but also in the anthroposphere. Humans can be exposed to HBCD by inhalation of vapor and airborne dust through ingestion and by dermal contact, babies can be exposed during pregnancy and breast feeding, workers and consumers are mainly exposed through inhalation and dermal routes and exposure in the environment occurs mainly via the oral route [12]. HBCD is easily taken up and stored by organisms, especially in adipose tissue. Animal studies have shown that from a technical mixture of HBCD the different isomers are selectively metabolized in the body so that the α-HBCD isomer is accumulated to a greater extent [5,6,12,26]. Also in nature a similar selective metabolism occurs mainly via microorganisms [7,8,13]. Animal studies have confirmed a low acute toxicity, but liver weights were increased, liver enzymes were induced, and thyroid hormone levels were affected [4,12,14,24,25]. We do not know anything about similar effects in humans. One recent Dutch study on human prenatal exposure to HBCD and other organohalogans suggest relationships on sexual and psychomotor development in healthy infants [17].

To identify knowledge gaps and potential agreement or disagreement on the different aspects of the HBCD issue, a causal diagram illustrating scientists' current understanding of the cause-effect relationship between the production and use of HBCD and its potential impact on health was made (See Figure 1). The diagram was based on the latest review articles and reports available.

A group of experts was asked to express their confidence in the current knowledge in the different parts of the diagram by completing an online questionnaire. From these experts a group of eight was selected to complete a second questionnaire and take part in an expert panel workshop where the implications of

the results of the two different evaluations for policy and health were discussed. Priorities for further action were identified and the workshop aimed at arriving at a concrete expert advice for policy makers.

Assessment

Our first step in developing an expert advice on HBCD for policy makers was focused on prioritizing the results from our expert consultation: how severe are specific results with regard to public health risks? The results were used to set priorities of further attention for policy uptake.

Priority knowledge gaps

The top area issues that the expert panel group considered to be the most influential for the health impact for HBCD was *toxicology* and *concentration in the target tissues* and *exposure*. Toxicology concerns the effects of a substance inside the body, and this area issue was ranked as number one. A request for more toxicological and epidemiological evaluation of the risk issue was raised. Concentration in the target tissues is a result of exposure and toxicokinetics, (more specifically what happens to the substance inside the body, how the substance is absorbed, distributed, metabolized and excreted). Toxicokinetics was ranked as number two. Exposure deals with the different routes of exposure, e.g. inhalation, ingestion, dermal.

Most experts in the panel had medium to very high confidence in science coming up with usable or decisive knowledge within the next five years if given sufficient resources. Most experts moreover had medium to high confidence in the possibility that policy actions to effectively manage the health risks of HBCD, will become technically (not politically) feasible within the next five years.

Weight of knowledge

During the expert panel discussions there was a general opinion that it is very difficult to be very certain about HBCD since there are less data available for this compound than for e.g. decaBDE. More specifically, there is a lack of epidemiological and toxicological studies, especially in humans [12]. There are limited data from toxicological studies of the targets of HBCD and of the mechanisms of action of HBCD. In addition there is very little information of the concentrations of HBCD in the target tissues, first of all due to lack of adequate studies on absorption, distribution, metabolism and excretion, but also because the different isomers of a technical mixture of HBCD are selectively metabolized in the body, so that α-HBCD is accumulated which behave differently from the original technical mixture [12,15,18,26]. It was also argued that there is a data gap on human exposure to HBCD, too little is known about normal exposure to the general population. Some exposure studies on children exist on sexual and psychomotor development in healthy infants [17] and estimations of exposure of occupational workers have been done [12]. Also the expert panel group considered that HBCD measurements performed in the past using the GC/MS technique are questionable compared to the LC/MS method used today [1,16].

Experts disagreed on the extent to which knowledge on the risks of HBCD justifies a more drastic policy intervention. On the basis of the persistence and bioaccumulation properties of HBCD, most experts suggested that policy makers should introduce regulations on restricting and prohibiting activities. Other experts felt that more data and better understanding are required before such drastic policy measures can be justified, they also claim that the use of suggested alternative compounds [10] is not proven to be safer, and developing safe alternatives take time. One expert considered restrictions and prohibitions of the compound ethically justified.

Some experts pointed out that studies performed on certain other persistent organic pollutants constitute a sufficient basis to justify, by analogy, concerns about the health effects of HBCD to humans. With these other chemicals, risk was first assessed at high doses in adults, but later more sensitive endpoints were detected at lower doses and often in earlier-life stages. One expert pointed out that one such endpoint could be vitamin K metabolism and subsequent impact on blood coagulation, and another endpoint could be leptin metabolism and possible impact on body weight [2,19,23]. Other experts do not agree in these conclusions based on the analogy to other persistent organic compounds.

It was suggested that in order to achieve what we want, more investment in fundamental science as well as policy measures such as monitoring activities is required.

It was claimed that there is no laboratory or institution in Europe where politicians and officers can initiate studies such as those within the US NTP program.

It was suggested to start randomized controlled trials of new medications or chemicals and to have permission from an ethical committee.

Based on the answers from the questionnaire and discussion at the workshop, the invited experts were not in agreement on whether or not the knowledge currently available is sufficient to justify more strict policy actions at this point. While most experts felt that the persistence and bioaccumulation properties of HBCD are enough to justify a ban or restrictions on use, others felt that more data is required before a decision to change the status quo is justified.

Recommendations

More research data and monitoring on HBCD is necessary to better support policy actions. The priority areas suggested were:

I. More research data and monitoring of epidemiological and toxicological studies of HBCD, especially in humans. Do randomized controlled trials and have permission from an ethical committee.
II. More research data and monitoring of the concentration of HBCD at the target tissue. Individual HBCD isomers need to be studied separately.
III. More research data and monitoring of exposure to HBCD, especially human exposure and exposure to the general population.

Suggestions for improving knowledge could be:

I. More research must be required from the industry itself that produces HBCD.
II. Better organized research, collaboration between universities and specific laboratories for required research studies.
III. Decisions taken and more money invested by policy makers in the required research.

Better information on safety of alternative substances is needed.

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HENVINET policy brief-DecaBDE

HENVINET Policy Brief:

Expert Elicitation on Health Implications of decaBDE

Policy context

- Deca-brominated diphenyl ether (decaBDE) is a flame retardant widely used in products such as electronics and textiles to impede development of fire and thereby save lives.
- DecaBDE is persistent in the environment, but differs from other polybrominated diphenyl ethers (BDEs) with respect to some important physicochemical properties: it is less absorbable into human and animal tissues; it accumulates less in these tissues; and it has a lower level of toxicity. On this basis, decaBDE has been less strictly regulated in many countries than other BDEs.
- There is a substantial build-up of decaBDE and a high predominance of this congener compared to other BDEs in some environmental compartments such as sediments, soils and dust. One concern relates to data demonstrating that decaBDE, under such circumstances can be broken down to other brominated compounds already banned. Another concern is to what extent microorganisms in the intestines and metabolism in the body are capable of transforming decaBDE to more toxic and bioaccumulating BDEs or other potentially harmful metabolites.
- The relatively high levels in the environment may lead to risk for substantial human exposure. In particular, the predominance of decaBDE in house dust may be a major exposure route for small children.
- Toxicological effects observed in animal studies include effects such as disruption of the development of the neurological system and hormonal balance at doses relevant to humans.
- Knowledge of the potential risks of the alternative chemicals to decaBDE is limited.

Policy options

In order to evaluate the state of the current scientific knowledge and highlight important policy considerations, experts were approached by two questionnaires followed by a workshop. Based on the answers from the questionnaires and discussion at the workshop, it was concluded that:

- All experts agreed that more research and monitoring are needed in order to develop a better understanding of the risks involved in the use of decaBDE.
- Experts agreed that three priority areas to investigate are:
  I. The extent to which the substance is transformed to compounds with more tissue accumulating and toxic properties in the environment (other OH-BDEs and PDBEs with lower bromine content);
  II. The extent to which humans and animals are exposed to the compound, especially from food and dust;
  III. The extent to which decaBDE is transformed to more harmful substances in the human body.

This is to some extent supported by recent reviews and reports

- Effort should also be invested into research on the toxicity and environmental behaviour of the most frequently proposed alternatives to decaBDE before they are applied on a large scale.
- In order to accelerate the rate at which policy relevant information becomes available, experts feel that research collaborations between publically funded institutions and universities should be organised at the European level. In addition to publically funded research, industry should be required to provide more toxicological data.
- There was disagreement among the experts as to whether additional research would yield decisive knowledge on key issues related to decaBDE and its alternatives within five years, given adequate resources. Whereas most were either optimistic or meant that there already is sufficient decisive knowledge available, others stated that research requires more time. Most experts moreover had a medium to high degree of confidence that policy actions to effectively manage the health risks of decaBDE are technically (not necessarily politically) feasible either now, or will become so within the next five years.
- While there was disagreement, the majority of experts felt that, in light of the current, all be it limited, knowledge available on the risks of decaBDE, a precautionary ban or restrictions on the use of decaBDE are warranted.

Executive summary

Situation

Brominated flame retardants are used in many different consumer products with the aim of retarding development of fire and thereby save lives and reduce material damage (www.bsef.com). One group of brominated flame retardants is the polybrominated diphenyl ethers (BDEs). The different types of BDEs differ with respect to the number and position of bromine atoms in their molecule. DecaBDE, also known as BDE209, has the highest possible number of bromine atoms. The technical mixture of decaBDE contains small amounts of the nonaBDEs, 3% or less [1]. This mixture is almost exclusively used in electrical and electronic equipment, transportation sector, construction and building, and textiles [2].

Different research and policy communities have different points of view regarding the potential hazards of decaBDE. Penta- and octabrominated diphenyl ethers (penta- and octaBDEs) were found to accumulate in animal and human tissues and to cause harmful health effects, and were banned in the EU in 2004. The primary North American manufacturer voluntarily ceased their production [3]. The fully brominated BDE congener, decaBDE was regarded less toxic and was eluded from the ban [3]. In 2008, the European Court of Justice decided that the Commission had exempted decaBDE from the ban on false premises and consequently again a ban was put to its use in electrical and electronic products[4]. In Norway, a total ban was introduced in April 2008. Also, the states of Maine and Washington have restricted the use of the substance in certain products, but still many major uses of deca-BDE are allowed in North-America [2].

Since 2005, many companies have reduced the use of or phased out decaBDE voluntarily without specifying which flame retardants they use as substitutes. The main alternatives being proposed for decaBDE are other brominated compounds, phosphorus containing flame retardants and inorganic, non-phosphorus compounds. Data of the potential risks of these alternatives are limited.

Background

DecaBDE (BDE209) has shown in several studies to be the most abundant PBDE in sediments, sewage sludge, soil, dust and air [5,6]. Also, it shows a build-up over years in sediments [6]. An increasing number of studies show that decaBDE is being transformed into more accumulating, more toxic substances in some environmental matrices in processes involving e.g. microorganisms and sunlight [6,7]. Inhaled and ingested dust is probably the main route of exposure, together with ingestion of food, while direct dermal contact may also play an important role [8]. The developing foetus and infant will also be exposed through placenta and via mother's milk [1,8]. DecaBDE is absorbed from the intestines to a lesser extent than the other BDEs [9] and when absorbed it is distributed differently. That is, it is measured in relatively higher concentrations in blood and in the liver than in fat tissue which is the primary site of accumulation for the lower brominated compounds [1]. DecaBDE also accumulates to a lesser extent than other PBDEs in the body. Animal experiments have shown that decaBDE may be metabolised into more toxic and accumulating BDEs in the gut by microorganisms before absorption, as well as in the liver after absorption [1]. The presence of highly brominated metabolites not found in technical mixtures of BDE in human plasma [10] may indicate debromination also in humans, though exposure to environmentally

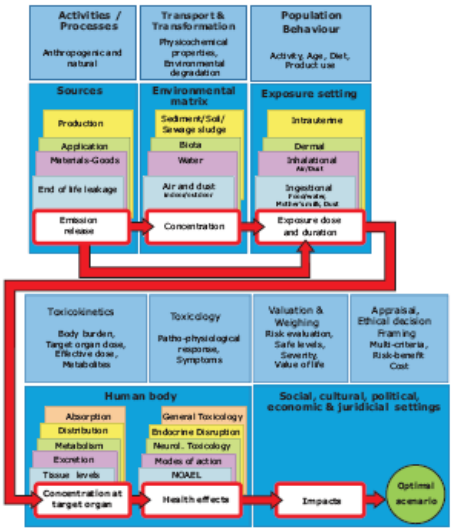

Figure 1. Diagram developed by HENVINET and used by experts to evaluate the current understanding of the cause-effect relationship between the production and use of decaBDE and its potential impact on health. The diagram has been slightly adapted to comments from the experts.

formed metabolites is also a possibility [11].

DecaBDE also appears to be excreted more rapidly from the body than the lower brominated BDEs [9]. Subchronic studies in rats have showed toxicological effects only in animals exposed to much higher doses compared to the other PBDEs [9] . More recent studies have been focussing on exposure to lower doses, closer to the real-life scenario during sensitive time frames of development and observed effects on neurobehavioural endpoints [9,12] and the thyroxin hormone balance [1,13]. There are not many existing effect studies and some are also criticized for their experimental design. The decision by the US Environmental Protection Agency to use one of these studies to set the oral reference dose led to discussions and objections from the industry [14].

To identify knowledge gaps and potential agreement or disagreement on the different aspects of the decaBDE issue a causal diagram illustrating scientists' current understanding of the cause-effect relationship between the production and use of decaBDE and its potential impact on health was made (See Figure 1). The diagram was based on the latest review articles and reports available and made similar to more brominated flame retardants.

A group of experts was asked to express their confidence in the current knowledge in the different parts of the diagram by completing an online questionnaire. From these experts a group of eight was selected to complete a second questionnaire and take part in an expert panel workshop where the implications of the results of the two different evaluations for policy and human health were discussed (Copenhagen 1905 2009). Priorities for further action were identified and the workshop aimed at arriving at a concrete expert advice for policy makers.

Assessment

Because of its wide use and environmental occurrence, preventing potential adverse effects on human health caused by decaBDE

is a task for authorities around the world. Taking appropriate political actions requires sufficient knowledge on the different aspects of chemicals, especially given the potential economic and safety consequences of a ban. The required weight of knowledge that is needed to support policy measures with regard to such issues is not well defined and open for debate amongst experts, policymakers and stakeholders. Both monitoring, modelling, epidemiological and experimental research are, however, quite time and money intensive. Therefore, the most important issues must be identified and prioritized.

Priority knowledge gaps

The top three most relevant areas to study further in order to assess the health impact of decaBDE were identified.

- In agreement with a recent review [3], the first area to prioritize is understanding better the magnitude of environmental transformation of decaBDE. The high abundance and temporal build-up measured in some environmental media are a cause for concern because of the evidences of transformational processes, resulting in more bioavailable and toxic BDEs [6]. If bromine is cleaved off from the decaBDE molecule in nature, the compound is transformed into lower brominated congeners which are already banned for their accumulating properties and toxic nature [6].
- Sources and magnitude of oral exposure is the 2nd prioritized area. There is too little knowledge on the extent of oral exposure in humans, from food and dust. There are data suggesting high exposure in children [9]. Monitoring of levels in humans, food and environment will provide a better insight in the main routes of exposure. It is also important to gain more knowledge on exposure in utero as the foetus may be more vulnerable than adults.
- The fate of the compound in the body is a third very important data gap relevant for human health risks posed by decaBDE. Toxicokinetics is the study of how a substance gets into the body and what happens to it in the body. The most important question is whether and to what degree decaBDE is metabolised in the human body to other more accumulating and toxic less brominated BDEs or readily excreted [1,8].

Also, toxicological health effects were considered an important area to prioritize. Some experts considered this to be among the top three priority areas.

There was disagreement amongst experts whether conducting more scientific research would yield decisive knowledge on the risks of decaBDE within the next five years. While most experts were either highly confident or meant that sufficient knowledge already exists, others claimed that high quality research requires more time.

Policy Considerations

Arguments for using the precautionary principle to ban or restrict the use of decaBDE would be the environmental abundance and increasing levels as described by Ross et al. 2008 combined with the uncertainties and potential threats in the priority areas described above and in recent reviews and reports [1,9]. Also, transport over long distances is indicated by the concentrations in remote areas, far away from production and use [3].The effects observed in animal studies involve brain development and hormone balance which are regarded highly relevant. A lesson is to be learned from other persistent organic pollutants where more sensitive endpoints were being detected at lower doses often at earlier life stages after initial assessment of high doses in adults on robust endpoints. There is also a risk that the most sensitive endpoints for decaBDE are still not detected. Then, the environmental load will have extensive consequences.

One expert pointed out that such a sensitive endpoint could be vitamin K metabolism and subsequent impacts on blood coagulation, as decaBDE has been reported to affect enzymes involved in this process [15,16]. Finally, one expert considered restrictions and prohibitions of the compound ethically justified, stating that it is unethical to pollute a whole population in order to prevent some fires.

On the other hand, the existing knowledge does not necessitate a ban, as few toxicological studies exist, and there is lack of knowledge regarding the margin of exposure; maybe the human exposure is not big enough for causing effects. The toxicological activity appears to be lower of decaBDE itself compared to BDEs with less bromines [9].

Another argument against a ban, is that the industry may take into use compounds that are less studied and have not been subjected to risk assessment [17]. However, for some uses, alternative compounds exist [17] which at least are not persistent.

Most experts had medium to high confidence in the possibility that policy actions to effectively manage the health risks of decaBDE will become technically (not politically) feasible within the next five years.

Based on the answers from the questionnaire and discussion at the workshop, the invited experts were not in agreement on whether or not the knowledge currently available is sufficient to justify more strict policy actions at this point. While most experts felt that the persistence of decaBDE and the transformation into bioaccumulating and toxic compounds are enough to justify a ban or restrictions on use, others felt that more data is required before a decision to change the status quo of this economically and technically important compound is justified.

Recommendations

There is a need for more research and monitoring of the substance to better support policy on this substance. Priority areas were defined as:

I. Environmental transformation of decaBDE into related lower brominated compounds with known abilities to accumulate in the body and to cause toxic effects
II. To what extent humans are exposed to decaBDE, in particular in utero, through food, mother's milk and dust.
III. The toxicokinetic properties of the compound, with special focus on the potential breakdown of decaBDE to the lower brominated BDEs and toxic metabolites in the human body.

Suggestions for improving knowledge could be:

I. To require more research and toxicological testing from the industry itself.
II. Better organised research cooperation between universities and research institutions at the European level
III. Better funding for relevant research.

There is a need for information on alternative substances.

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ABSTRACT
The aim of this report is to describe the different levels of communication and dissemination within the Health and Environment network. Furthermore, the plan describes the communication and dissemination objectives, the communication tools, strategies, timing and target audiences. The communication and dissemination plan is required according to the contract with the European Commission. This document is the final update of the communication and dissemination plan of HENVINET. It includes:

- Dissemination and communication plan
- Strategy proposal for Stakeholder Engagement
- Request for side-event at Ministerial conference on Health and Environment in Parma, Italy, March 2010
- HENVINET project leaflet
- HENVINET portal leaflet
- HENVINET portal fact and figures
- HENVINET Decision Support Tools leaflet
- HENVINET policy brief-CPF
- HENVINET policy brief-Phthalates
- HENVINET policy brief-HBCD
- HENVINET policy brief-DecaBDE

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