



PAVING THE WAY FOR REACH

The Voluntary Emissions Control Action Programme
THIRD ANNUAL PROGRESS REPORT 2008



This report aims to introduce the Voluntary Emissions Control Action Programme (VECAP¹) to a wide range of audiences, including regulatory authorities, user industries and the general public as a whole. It is designed to provide transparent and concise information on the progress of VECAP on an annual basis. Any feedback or comment on the following report is welcome and will be considered for future editions.

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¹ VECAP and its logo are currently subject to a Community trademark before the OHIM.

Highlights

The VECAP programme has evolved from its original concept of a tool to control emissions during handling and use of brominated flame retardants, and is rapidly becoming a system for management of chemicals, which can be applied to a much wider range of processes and raw materials. During 2007 we identified an emerging issue - residues in packaging - and identified the importance of correct disposal of used packaging. Investigations by the VECAP team suggest that there is an opportunity for further improvement in packaging, comparable in level to those potentially occurring during processing; and that this issue is certainly not limited to the packaging of flame retardants. We are raising awareness of this in the industry, as well as working to get a clearer picture of its scope, and its impact on our strategy for emission control.

Mission Statement

VECAP's mission is to establish a framework for sustainable management of chemicals by a better understanding of industry processes throughout the supply chain.

Foreword by Marks & Spencer plc

VECAP is a great example of how chemicals need to be managed in the 21st Century, true producer responsibility.

Here is a sector of the chemical industry that has been under more pressure than most but has responded to the challenges before it by developing a ground breaking model for control. VECAP's strength lies in its focus on the use of brominated flame retardants across the whole value chain, not just at one stage within it. It is based on the use of common sense best practice; often small things that added together can make a real difference. Of course it doesn't just rely on words on paper but brings things to life on the factory floor with good practice guides, training and

audits. Finally VECAP does not duck the challenge of debate with those stakeholders who may criticise the performance of the industry, nor has it hidden from the need to back up the claims for its potential with evidence of real year on year improvement in reducing emissions. Put together this value chain approach, best practice, training, measurement and debate and we have a model that shows how a sector of the chemical industry can go beyond compliance with legislation and develop a far more sustainable approach to doing business.

Mike Barry

Head of Corporate Social Responsibility
Marks & Spencer²

² With one of the most instantly recognized household trade marks (St Michael), Marks and Spencer UK is one of the best known department stores. Starting as a small market stall in Leeds this British company also has stores in a further twenty-five countries worldwide. Annual turnover is around £7 billion with Marks and Spencer remaining one of the best known British retailers. It retains a proud heritage built on the five principle values of innovation, quality, service, trust and value (source: UK Share Net).

01 Introduction to VECAP



In 2004, the European industry sector comprising brominated flame retardant manufacturers initiated VECAP to apply the best available practices when handling their products, both at manufacturing sites and down into the supply chain. VECAP is developed and implemented in partnership with the flame retardant user industries and aims to set new standards on chemicals management in the workplace. It helps to improve the understanding of the supply chain processes and also creates awareness on substances management. As such, VECAP is already in compliance with the European Regulation on the Registration, Evaluation, Authorisation and Restriction of Chemical substances (REACH) obligations to engage downstream users in the management of chemicals.

WHAT IS VECAP?

VECAP is a tool for:

- increasing the awareness and understanding of chemicals management beyond existing legislation throughout the supply chain and for promoting and facilitating an open and constructive dialogue with all interested industry, regulators and stakeholders
- Creating awareness for all people involved in manufacturing, from shopfloor to managers

VECAP is an innovative and excellence-driven way of doing business, based on ISO9001/14001 principles:

- it demonstrates the commitment of the industries involved to act in a manner which supports the interests of society and the environment while enhancing the competitiveness of local industries
- it offers all companies – small, medium or large – equal access to the industry's expertise in environmental and process performance best practice. Such access drives continuous improvement and allows benchmarking for other industries to apply similar principles.

³ EBFRIP (European Brominated Flame Retardant Industry Panel – www.ebfrip.org) and BSEF (Bromine Science and Environment Forum – www.bsef.com)

“For all industry and regulatory stakeholders, REACH involves key changes in chemicals management. Since its introduction in 2004, VECAP has prepared the ground for REACH implementation, showing advance practice by engaging with companies and working jointly throughout the supply chain, towards adequate control”

Leo Appelman
Managing Director - ReachCentrum



HOW DOES VECAP WORK?

The VECAP process is structured to support the principle of continuous improvement, with the six steps moving in a cyclical manner:

COMMITMENT TO THE VECAP CODE OF GOOD PRACTICE (CoGP)

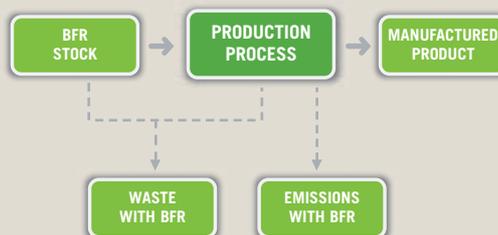
The VECAP system starts with the user's commitment to the programme, adopting the Industry's Code of Good Practice and implementing these principles into the procedures and work instructions of their daily operations. As an annex to the Code, a Best Available Technique (BAT) guidance document for emptying packaging has been developed. An additional BAT guidance document to empty Intermediate Bulk Containers (IBC), drums or containers efficiently will also be annexed to the Code in the course of 2008.

SELF AUDIT

With the self-audit, the company verifies the production flow sheet of its operations.

MASS BALANCE APPROACH

The company completes the product mass balance (signalling the gap in the amount of product entering and leaving the production process).



BASELINE EMISSIONS SURVEY

The company uses the obtained results as a baseline to demonstrate actual performance and to detect future priorities for improvement in chemicals management.

CHEMICAL MANAGEMENT IMPROVEMENT PLAN

An emission improvement plan is determined in line with the company's own objectives and policies.

IMPLEMENTATION AND CONTINUOUS IMPROVEMENT

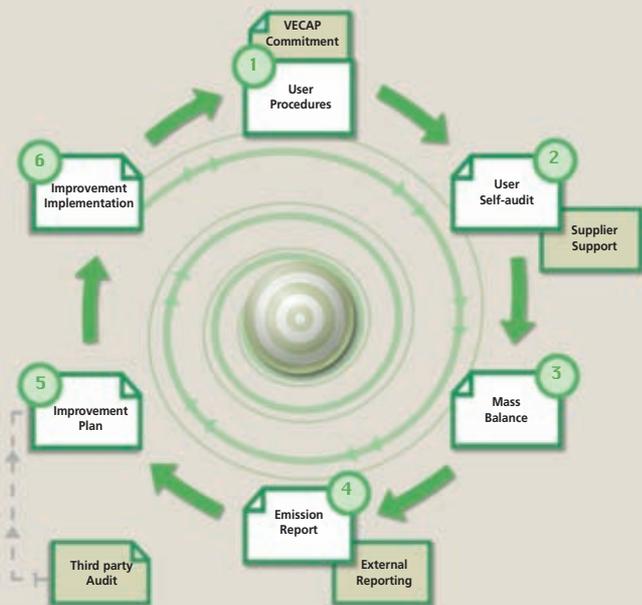
Once the improvement plan is implemented, operational results are evaluated and potential for further emission reductions investigated, ensuring effective continuous improvement.

01 Introduction to VECAP

"VECAP is a good example of effective cooperation throughout the whole supply chain. In line with GM's commitment to environmental excellence, the programme ensures that the chemicals included in our products are safely managed. Moreover, as it allows a better management of substances, VECAP is particularly relevant in the context of REACH and of the development of the new chemical regulation in the US."

Dr. Pat Beattie, Director Chemical Risk Management, General Motors Corporation
Dave Mattis, Global Technology Engineering, General Motors Corporation

VECAP PROCESS



VECAP CERTIFICATION

During the first phase of VECAP implementation, data were collected directly from users on a voluntary basis. This information was then processed by the VECAP Product Steward to ensure confidentiality and compliance with the applicable competition legislation. However the scope of VECAP has now expanded to the point where independent certification is necessary. A scheme has been developed based on ISO9001/14001 principles, with audits carried out by independent auditors. The organisation of the auditing process and delivery of the VECAP Certificate will be done by specialised certification bodies such as Bureau Veritas⁴ to guarantee maximum independence. Pilot trials of the certification scheme are in progress, and it is expected that by 2010, around 50% of the Deca-BDE volume in Europe will be covered by this scheme.

⁴ <http://www.bureauveritas.com>

02 VECAP progress report 2008



Today, the level of commitment to VECAP for Deca-BDE has risen to over 95% for textiles users and over 80% for plastics users

BACKGROUND AND EVOLUTION

The origins of the VECAP programme lie with the UK Textile Finishers Association (TFA), who in 2004 initiated a Code of Good Practice that called on the UK textiles industry to audit their processes, and take action to reduce Deca-BDE emissions from their processes. These actions ranged from simple adjustments to working practices to the installation of an effluent treatment plant. The companies involved varied in size from 7 to 350 employees.

In the last 4 years, regular surveys of the UK situation have shown good progress towards bringing emissions from processing into a high level of regulated control. After impressive first results, later gains were often more difficult to achieve, requiring a blend of changed practices and investment in innovative technology in the plant. Today, uncontrolled emissions with a diffuse fate in the environment have been virtually stopped. VECAP has delivered clear results for the UK Textile Industry.

From this promising start, the process has been adapted to meet the wider needs of the European textile and plastics industries, also with notable successes, already documented in our previous Annual Progress Reports⁵.

Today, in the UK, France, Belgium, Germany and Italy the level of user commitment on deca-BDE within VECAP has risen to over 95% for textiles industry users, and over 80% for plastics industry users⁶.

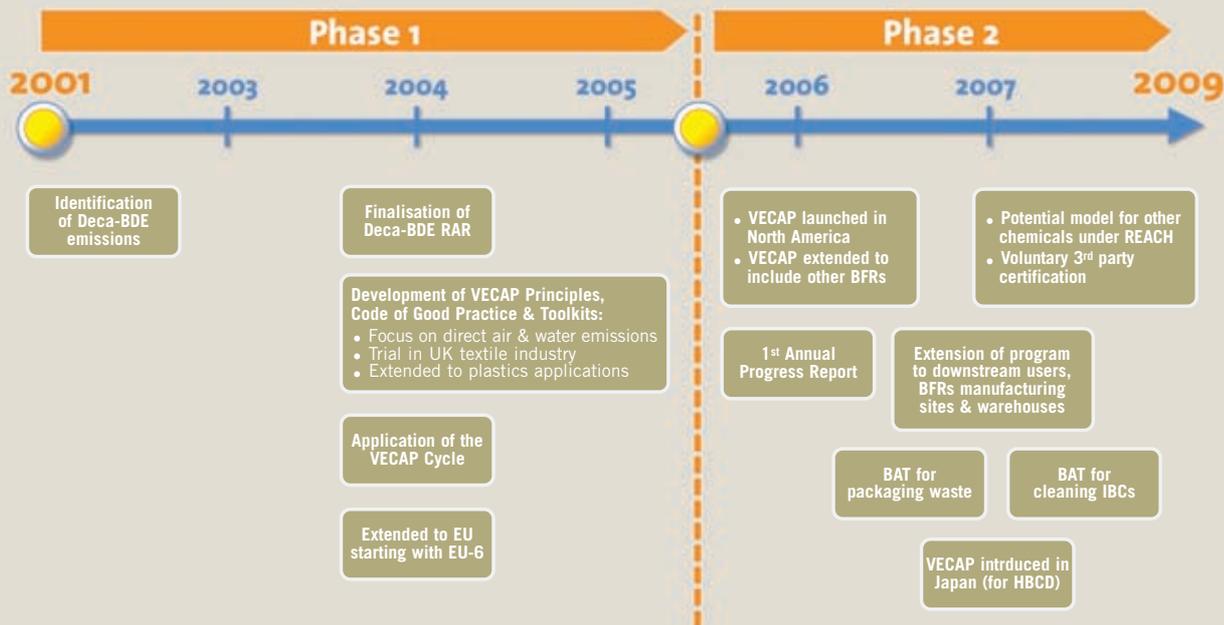
More importantly, VECAP principles have been applied to users of other flame retardants, and have been recognised as providing a more widely-based materials management system which can be applied to other chemicals in other industries.

⁵ The reports can be downloaded from the website <http://www.vecap.info>

⁶ Figures collected by the VECAP team, gathering together technical experts from the EBFRIIP member companies and the VECAP Product Steward. The EBFRIIP companies are estimated to represent over 90% of the total Deca-BDE sales in Europe.

OVERVIEW OF 2004-2007 PROGRESS ACHIEVED

VECAP DEVELOPMENT



PROGRESS IN EMISSIONS CONTROL: THE EMERGING ISSUE OF PACKAGING RESIDUES

At the inception of VECAP, four years ago, there was a high degree of focus on the need to interest users in the concept of assessing and, where the need existed, reducing process emissions. This is reflected in the excellent levels of user enrolment achieved so far, and the significant reductions in process emissions achieved, particularly in the UK.

As well as broadening user involvement, the VECAP team and Product Steward have continued to call on to existing users, to assist in analysis of process emissions and to recommend strategies for their reduction. In the course of this work we have developed a better understanding of best practice in process emission control, as well as a greater degree of awareness of additional areas for improvement in the use and handling of chemicals in general.

One potentially significant source of process emissions identified during 2007 is the handling, cleaning and disposal of used packaging, and a varied picture is emerging today as to the levels of residue present and the effectiveness of options of disposal by users. Different packaging types can be used for chemicals, dependent on the industry sector and the physical form of the product required for user processes (for example as powder or liquid). The packaging types range from small (25kg) sacks, made from paper or polyethylene, through woven fabric “big bags” of 500kg–1000kg capacity, to occasional “bulk” deliveries of several tonnes in trucks or containers. In the textiles industry, 1000kg polyethylene containers are also used for packaging at intermediate stages of the process. Clearly, the potential for residue to remain in packaging after use varies with its type, as well as with emptying and cleaning procedures, and whether this residue subsequently results in an emission to the environment depends on user procedures. With this in mind, the use of best practice in emptying packaging is pro-actively being promoted

“We have been following VECAP’s progress with great interest for several years. As a regulator, we can only but support proactive industry initiatives such as VECAP which are already demonstrating their effectiveness in managing chemicals throughout the manufacturing processes. Moreover, we believe VECAP’s philosophy of adequate control throughout the supply chain will help businesses to adjust to the new REACH regulatory environment.”

Roberto Binetti

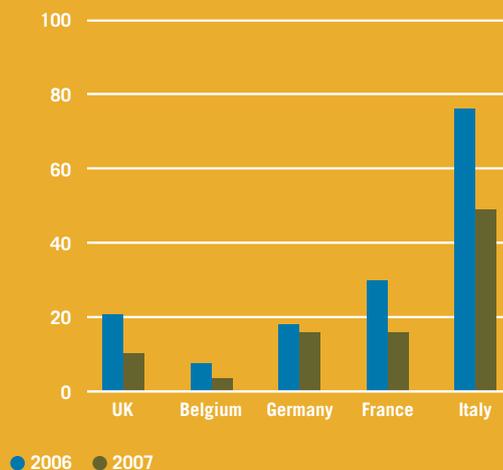
*Italian Competent Authorities representative
Istituto Superiore di Sanità, Italy*

at VECAP members. In our growing experience, the key to emissions control from packaging is development of awareness of the issue, and means to address it throughout the supply chain.

This is “work in progress”, but today we are confident that by far the major part (around 90%) of packaging residues of, at least, BFRs are effectively controlled, via disposal either to regulated landfill sites, or to controlled incineration plants. We are actively pursuing users to clarify the fate of the remaining 10%.

Process emissions have shown reducing trends throughout Europe (see graph on this page), and we will continue to monitor and encourage users in their efforts to reduce this further. However, in the coming year we will divert the main part of our efforts onto achieving a better understanding of packaging emissions as well as to further raise awareness and promote action at users. We will specifically engage users further down the supply chain, such as textiles backcoaters. The VECAP Product Steward has started to visit these users plant sites to assess the situation and raise awareness on the packaging issue.

Example of trends in Deca-BDE process emissions to air and water by the plastics industry (Kg/pa)



PROGRESS IN EMISSIONS CONTROL: BEST PRACTICES

Also in 2007 we have started to develop “Best Practice” techniques and “Good Housekeeping” rules to assure minimal waste generation during processing and materials handling (e.g. residual product in packaging, off spec product, etc). In the event of waste generation, these waste streams should be incinerated or end up at controlled chemical land filling, depending on local regulations. The logistics of these operations are mostly done via waste handlers’ services.



Analyses performed by the VECAP team have shown that waste handlers normally assure waste treatment and their final destination in total compliance with all existing legal obligations. However, because BFRs and their formulations often do not require labelling as dangerous material, it is far from automatic for waste streams to be incinerated or directed to chemical land filling. The VECAP team is contacting and visiting waste handlers to create awareness about the recommended ways to treat these waste streams, aiming at an adaptation by

waste handlers of the relevant procedures and working instructions. In parallel, EBFRIP producers are adapting labeling procedures to inform all involved parties that proper handling of waste is an essential part of the supply chain, to reduce potential environmental impacts.

Informing and training workers in users’ plants also forms an integral part of VECAP. After the user company management has committed to VECAP, codes of good practice are implemented by specialist workers on industrial sites. This mainly involves the “first line” process workers who are handling or controlling the substances directly, and specific information tools have been developed to help them in that task. For example, brochures illustrated with step-by-step instructions, posters to be used on site, as well as stickers to be added on chemical substances packaging are now available to companies to inform their workers.



Finally, the VECAP has now been expanded to cover, in addition to users, potential emissions from warehouses used by BFR manufacturers to store their products before distribution. Over 95% of the warehouses in Europe have been audited. These audits have demonstrated the high level of compliance with the VECAP principles in the operation and handling of products in these facilities.

“Fedustria supports the Belgian textile industry members to optimize their processes in order to fulfil technical requirements and respect environmental demands. The VECAP system is creating awareness of the involved issues and at the same time stimulates innovative development and implementation of practical solutions.”

*Bruno Eggermont
Fedustria*

**Case Study
VECAP for TBBPA additive use**

TBBPA additive is used in a major European plastics compounding plant, to produce flame retardant plastics granulate.

In 2005, on-site air and water measurements suggested significant emission levels that could potentially present environmental risks to both water and soil. Once aware of this situation, the plant engineers worked with guidance from the VECAP team to identify efficient ways to manage these concerns. Although the waste water leaving the plant was treated before entering the local river, the concentrations found in the effluent stream left room for improvement. Given this situation a radical solution was implemented – transfer of production to a more suitable process line. The risk characterisation ratios for 2005 and 2007 show the benefit of these changes (< 1 indicates no environmental risk):

Survey year	water	sediment	soil
2005	80	unknown	3
2007	< 0.1	0.7	0.4

A base-line survey also revealed that considerable quantities of TBBPA waste were being sent to landfill, as residue in big-bags used to deliver the product. These are now all sent for incineration, eliminating an additional emissions source of up to 150kg TBBPA per year.

Against the background of the commercial and technical demands faced today by a large production unit, VECAP created awareness of the issue, and provided the motivation and framework to reach a successful outcome, both for the producer and for the environment.

**Case Study
Knowing your processes and training your workers**

To apply Deca-BDE in textile applications, formulator companies prepare and transfer a coating formulation containing Deca-BDE into an IBC container of 1m³. Thanks to VECAP, one such formulator company was alerted to the potential existence of remaining residues after the emptying of this type of containers, which could sometimes total up to 25-50 kgs of residue per container and, by definition, could be emitted when the packaging was subject to waste management handling. In the framework of VECAP a best available technique brochure communicates to textile users the simple techniques to reduce these potential residues. For this particular formulator company, implementing these simple techniques (e.g. tilting the IBC on one side and putting a wooden wedge underneath) has resulted in a 90% reduction of the residues in IBCs.

“Euratex not only supports VECAP but we are strongly committed to its implementation. The textiles industry relies on flame retardant chemicals to comply with European fire safety standards. At the same time, the textiles industry recognises the need to manage carefully flame retardant chemicals in order to prevent their emission to the environment. Euratex has been involved and supportive of VECAP since its inception in 2004. VECAP enables textiles sector users of flame retardants to identify where they can act to reduce emissions. Our experience demonstrates that small-medium sized companies based in Europe can meet both the public expectations in terms of both fire safety and the environment.”

Adil Elmassi

DG Environmental Affairs - EURATEX

Case Study

VECAP IMPLEMENTATION BY THE FRENCH TEXTILES SECTOR

By applying VECAP in the textiles sector in France, industry has achieved remarkable improvements in process performance by implementing a number of projects under the guidance of the VECAP team. These improvements have led to a reduction in the estimated emissions of Deca-BDE– from over 1000 kg per annum (kg pa) estimated in 2005 to less than 10 kg pa today.

The following has been realised between 2005 and today by the French textiles industry:

- The initial VECAP surveys revealed a number of old air emission systems, without proper filters. With the installation of a number of new ventilation systems, with more appropriate filters, total estimated emissions were significantly reduced to < 1 kg pa.
- Water emissions were reduced to < 2 kg pa by improving the effectiveness of water treatment at textiles plants, and adopting secondary water phase treatment at municipal installations. Recent measurements were unable to detect any bromine in water effluent from the plants.
- In addition, the disposal of Deca-containing sludge, which presented a varied and uncertain picture in 2005, is now better understood and is now all done via controlled waste management.
- Deca-BDE packaging, normally in 25kg bags, used to be stacked in open containers and recycled as normal paper waste. Today, the empty bags are sent to industrial waste sites. Following the correct disposal at these sites (ie incineration), this leads to more than 90% reduction of the emissions from empty packaging.

VECAP IN NORTH AMERICA AND JAPAN

In 2006, VECAP was launched in the United States and in Canada. The VECAP North American team has been actively educating stakeholders by organising workshops to introduce VECAP to regulators, non-government organizations, trade groups and others interested in chemicals management.

Today in the US and Canada:

- 79% of Deca-BDE users have committed to VECAP, and 56% have established a mass balance survey
- 60% of TBBPA users have committed to VECAP and established a mass balance survey
- 39% of HBCD users have committed to VECAP, and 31% have established a mass balance survey

The first VECAP North America Progress Report was published in 2007 and is available for download at www.vecap.info.

In Japan, VECAP is today focused on HBCD and involves producers and users from the textiles and polystyrene foam industry. This programme is managed in close cooperation with the Japanese governmental authorities. After the launch in January 2007, significant progress has been achieved, with 88% of HBCD users now committed to VECAP.

03

Providing support to VECAP users

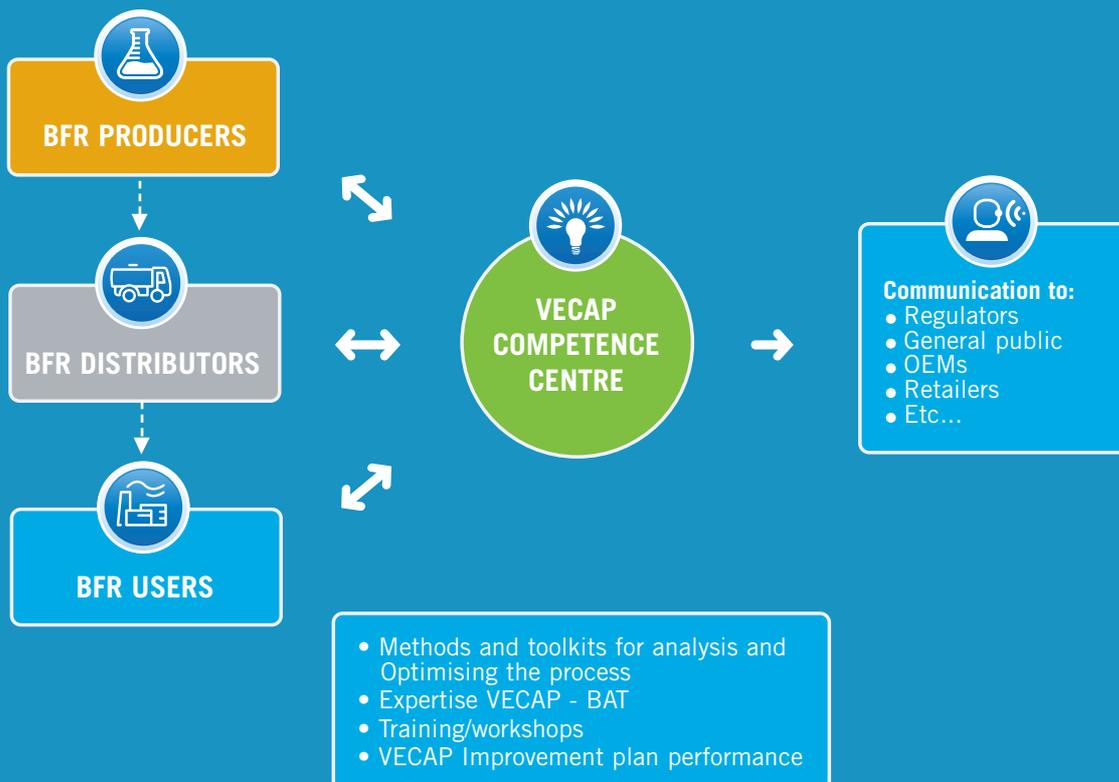


The competence centre was established in 2006 to support dialogue with VECAP participants

FAQ on VECAP implementation:

- Which air filter systems should I use?
- How to treat wastewater?
- What to do with packaging waste?

- General information on VECAP
- Information & data on implementation and progress
- Benchmarking & best practices
- Yearly progress report



03 Providing support to VECAP users

VECAP TOOLKITS

The VECAP Competence Centre has developed toolkits to assist the downstream users in the implementation of the programme and provide general principles for good chemicals management. These toolkits are available in several languages.

- Code of Good Practice: this document includes working procedures and good housekeeping measures for chemicals management
- Questionnaires where users can define where they stand in respect of the Code of Good Practice provisions
- Process flow chart: assists users to identify where the potential material losses can occur within the processes
- Mass balance sheet: indicates which data should be measured, recorded and managed
- Specific Best Available Techniques for emptying packaging and containers.
- Questions & Answers documents developed in order to provide answers to technical questions related to the implementation of VECAP.



WEBSITE

The dedicated website <http://www.vecap.info> has been set up to ensure first-hand access for VECAP participants and interested parties to the relevant information and materials relating to the development and implementation of VECAP.



The VECAP website aims at providing:

- an overview of the program, its scope, how it works, etc
- access to the materials that have been developed to ensure not only awareness and information about the program, but also access to the more technical tools such as the Code of Good Practice, the Best Available Techniques documents etc.

A special section is dedicated to the program in North America.

FOR FURTHER INFORMATION:

<http://www.vecap.info>

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ABBREVIATIONS

BAT	Best Available Techniques
BFRs	Brominated flame retardants
BSEF	Bromine Science and Environmental Forum
CEFIC	European Chemical Industry Council
CoGP	Code of Good Practice
Deca-BDE	Decabromodiphenyl ether
EBFRIP	European Brominated Flame Retardant Industry Panel
HBCD	Hexabromocyclododecane
HPV	High Production Volume chemicals (> 1000 tons)
IBC	Intermediate Bulk Containers
REACH	EU Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals
TBBPA	Tetrabromobisphenol-A
VECAP	Voluntary Emissions Control Action Programme



VECAP is a voluntary initiative of the European Brominated Flame Retardant Industry Panel – EBFRIIP together with the industry's global organisation, the Bromine Science and Environmental Forum – BSEF

EBFRIP
A SECTOR GROUP OF CEFIC



Responsible Care

T-F-A
THE TEXTILE FINISHERS' ASSOCIATION

BSEF
Bromine Science and Environmental Forum