

Study on Asbestos Waste Management Practices and Treatment Technologies

under FWC No ENV.B.3/FRA/2019/0017

Workshop Report
prepared for

DG Environment

June 2023

RPA
Europe

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Workshop Report

ARCADIS Belgium consortium

Quality Assurance	
Project reference / title	J91 Asbestos Waste
Report status	Workshop Report
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Date of issue	3 July 2023

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1 Introduction

As of 1 January 2005, Directive 1999/77/EC, amending Directive 76/769/EEC, banned the use of asbestos fibres throughout the EU. Subsequently, the REACH Regulation specified that the manufacture, placing on the market and use of asbestos fibres and products containing these fibres are prohibited, and Commission Regulation 2016/1005 amending Annex XVII to REACH aims to ensure the complete phase-out of asbestos products in Member States by 1 July 2025. However, the use of articles containing asbestos fibres which were already installed and/or in service before 1 January 2005 remains permitted until they are disposed of or reach the end of their service life. While asbestos may not be actively used and marketed, built-in asbestos still exists in asbestos-cement in buildings, pipes, insulation, stoves, heating devices, asbestos sheeting, and roofing.

In October 2021, the European Parliament adopted a resolution calling for a ‘European strategy for the removal of all asbestos’. In that resolution, the Parliament called for further EU action to protect workers and citizens from the health risks related to exposure to asbestos, especially in the context of the energy transition. The European Economic and Social Committee also called for the removal of all asbestos, underlining that works in energy renovations create synergies with the removal of harmful substances. The European Parliament highlighted that asbestos waste treatment should fully apply the precautionary principle and called on the Commission to propose a corresponding revision of relevant Union waste legislation. The Commission is committed to follow up on the resolution from the European Parliament. Therefore, evidence is needed for the European Commission to consider possible future legislative or non-legislative initiative(s) on this matter.

In 2022, the European Commission launched the ‘Study on asbestos waste management practices and treatment technologies’. The purpose of this study is to investigate asbestos waste management practices and technologies in Europe and beyond. The aim is to ensure that the waste hierarchy (Article 4 of the Waste Framework Directive) is applied to asbestos waste properly and consistently across the EU, i.e., that efforts are put in place to reduce the landfilling of asbestos waste and promote its recycling into a non-hazardous mineral fraction. The study is carried out by RPA Europe, RPA Prague, the Danish Technological Institute and ARCADIS.

A **workshop on ‘Asbestos waste management practices and treatment technologies’** was carried out on 15 June 2022 as part of the study on asbestos waste management practices and treatment technologies. It enabled the study team to consult with and get feedback from the stakeholders that perform different roles in the management and treatment of asbestos waste and to identify the participants for further consultation activities (semi-structured interviews).

The **report on the workshop** “Asbestos waste management practices and treatment technologies” aims to describe the organisation of the workshop and the stakeholder participation in the event, as well as to outline the main topics discussed during the workshop and the conclusions drawn from it. For analysing the content of the workshop discussions, thematic analysis – a qualitative method for distinguishing major patterns and themes in textual information was used.

The **report is structured** as follows:

- Section 2 describes the workshop objectives and agenda;
- Section 3 gives an overview of the workshop target audience, dissemination of information about the event and participation patterns (the list of organisations which participated in the workshop is available in Annex 1);
- Section 4 summarises the main themes that emerged in the workshop discussions; and
- Section 5 provides conclusions and next steps.

2 Workshop objectives and agenda

The workshop “Asbestos waste management practices and treatment technologies” took place online on Webex on 15 June 2023, starting at 9:30 CET and concluding at 16:00 CET. It aimed to exchange knowledge and ideas about the current policies and legislative landscape, practices and treatment technologies in the field of asbestos waste management. It brought together stakeholders from Member State competent authorities, waste management companies, construction and demolition businesses, waste treatment technology providers, non-governmental organisations and research institutions with knowledge and practical experience on asbestos waste management practices and asbestos waste treatment technologies in the EU.

The workshop commenced with an introductory session, followed by two topic-specific sessions (see the agenda below)

Timing		Agenda item
<i>Introduction to the study and preliminary findings (130 mins)</i>		
09:00 – 09:30	30 mins	Registration
09:30 – 09:35	5 mins	Welcome and housekeeping rules (Marco Camboni, RPA Europe)
09:35 – 09:40	5 mins	Welcome message from the Commission and introduction to the aims of the study (Enrique García John, DG Environment)
09:40 – 09:50	10 mins	Research questions and study methodology (Marco Camboni, RPA Europe)
09:50 – 10:05	15 mins	Quantities and sources of asbestos waste (Francesca Chiabrand, RPA Europe)
10:05 – 10:20	15 mins	Asbestos waste management legislation and practices in the EU (Daniel Vencovsky, RPA Prague)
10:20 – 10:35	15 mins	The current and emerging asbestos waste treatment technologies in the EU (Rūta Akelytė, RPA Europe)
10:35 – 10:50	15 mins	Q&A
10:50 – 11:00	10 mins	Break
<i>Topic-specific sessions and wrap-up</i>		
11:00 – 12:30	90 mins	Morning session: Management of asbestos waste in the EU: policies and practices (moderators: Daniel Vencovsky, RPA Prague) Keynote speakers: Stefania Butera (Danish Technological Institute) Olaf Dünger (ARCADIS)
12:30 – 13:30	60 mins	Lunch break
13:30 – 15:00	90 mins	Afternoon session: Current and emerging technologies for the treatment of asbestos waste (Zinaida Manžuch, RPA Europe) Keynote speakers: Nicolas Humez (Chairman of Hazardous Waste Europe) Jos Hofs (Chief Financial Officer at Asbeter Holding B.V.)
15:00 – 15:30	30 mins	Break
15:30 – 16:00	30 mins	Presentation of discussion outcomes and wrap-up

In the introductory session, the study team introduced the research questions and methodology of the study and provided an overview of the initial findings, including the outcomes concerning asbestos waste statistics, management practices, and treatment technologies. The participants had the opportunity to provide their feedback on these preliminary findings during a Q&A session.

Two topic-specific sessions then dived deeper into two areas:

- Management of asbestos waste in the EU: policies and practices; and
- Current and emerging technologies for the treatment of asbestos waste

The morning session 'Management of asbestos waste in the EU' **aimed** to get rich feedback (opinions and examples) from the participants on what elements (strategic directions, and practical actions) are crucial for designing and implementing effective asbestos waste management programmes in the EU Member States and how the EU-level action support these initiatives. In particular, **the discussion focused on:**

- Identification of best practices in asbestos waste management.
- Identification of any gaps in EU waste legislation as regards asbestos waste management.

The discussion session consisted of two presentations and a moderated discussion with the participants. During this session, two speakers – Stefania Butera (DTI) and Olaf Dünger (Arcadis Germany GmbH) from the study team presented case studies of asbestos waste management in Europe in two countries, Denmark and Germany.

The afternoon session 'Current and emerging technologies for the treatment of asbestos waste' **aimed** to get rich feedback (opinions and examples) from the participants on the most promising asbestos treatment technologies and the current state-of-the-art in their development. It consisted of two presentations and a moderated discussion with the participants. The session was opened by two external speakers, Nicolas Humez (Chairman of Hazardous Waste Europe) who presented his views on asbestos waste treatment technologies, and Jos Hofs (Chief Financial Officer at Asbeter Holding B.V), who delivered an overview of the technology developed at Asbeter.

At the end of the presentations in each session, the discussion was opened with the participants, who were able to exchange their views, share knowledge and provide feedback on these specific topics by taking the floor and intervening in the discussion or by writing in the event chat.

Finally, the study team wrapped up the workshop by presenting the outcome of the discussions .

3 Target audience

3.1 Event dissemination activities

Invitations to participate in the workshop were sent by email to 519 contacts representing Member State competent authorities, waste management companies, construction and demolition businesses, waste treatment technology providers, non-governmental organisations, and research institutions with knowledge and practical experience on asbestos waste management practices and asbestos waste treatment technologies in the EU.

The workshop was promoted through a post on RPA Europe’s LinkedIn webpage 10 days prior to the event and reposted by members of the study team and by attendees.

3.2 Participation in the event

A total of 95 participants joined the event (including participants from the study team) representing competent authorities, EU institutions, industry and trade associations, non-governmental organisations, researchers and business entities.

The list of affiliations of the workshop participants is provided in Annex 1. Originally, 115 people registered for the event, meaning that 83% of those who registered attended the workshop.

Representatives of all target audience groups attended the event (see Figure 3-1).

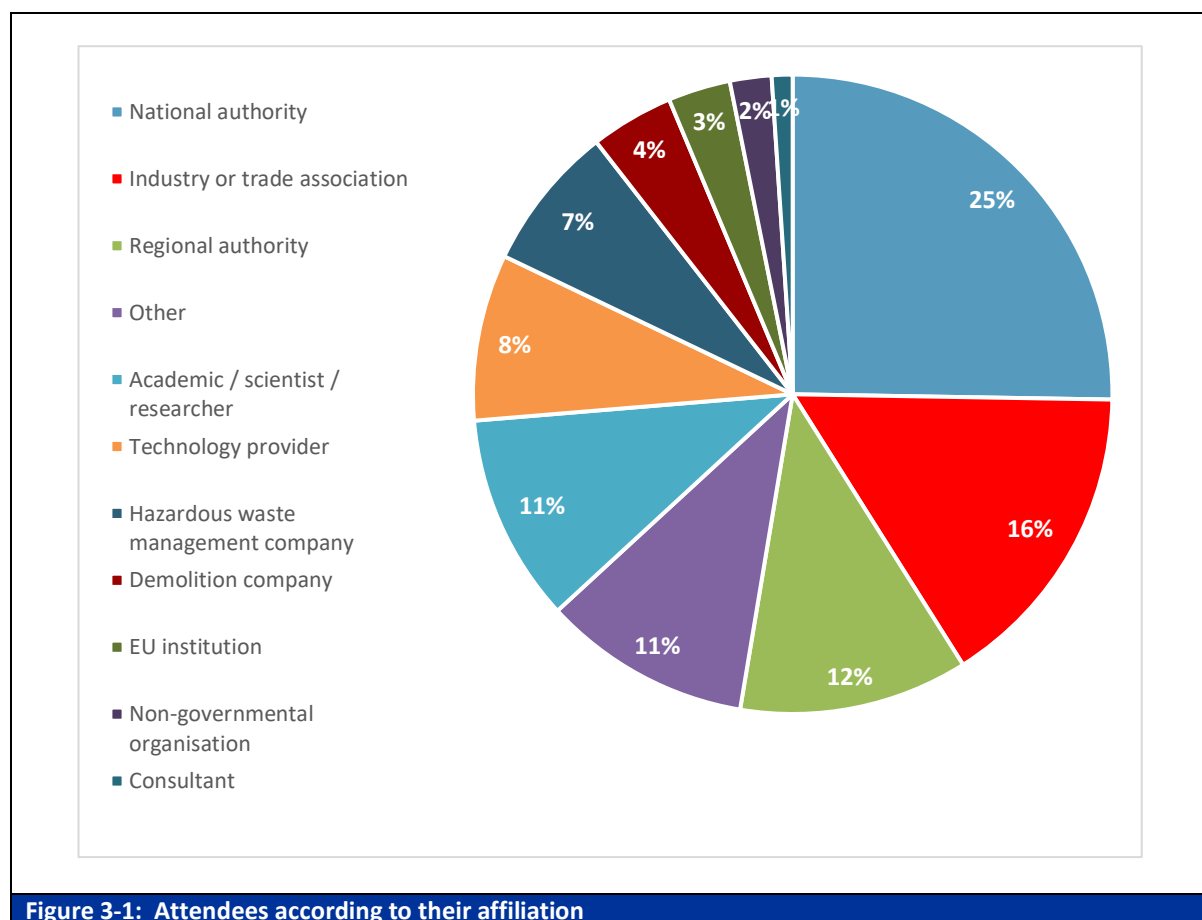
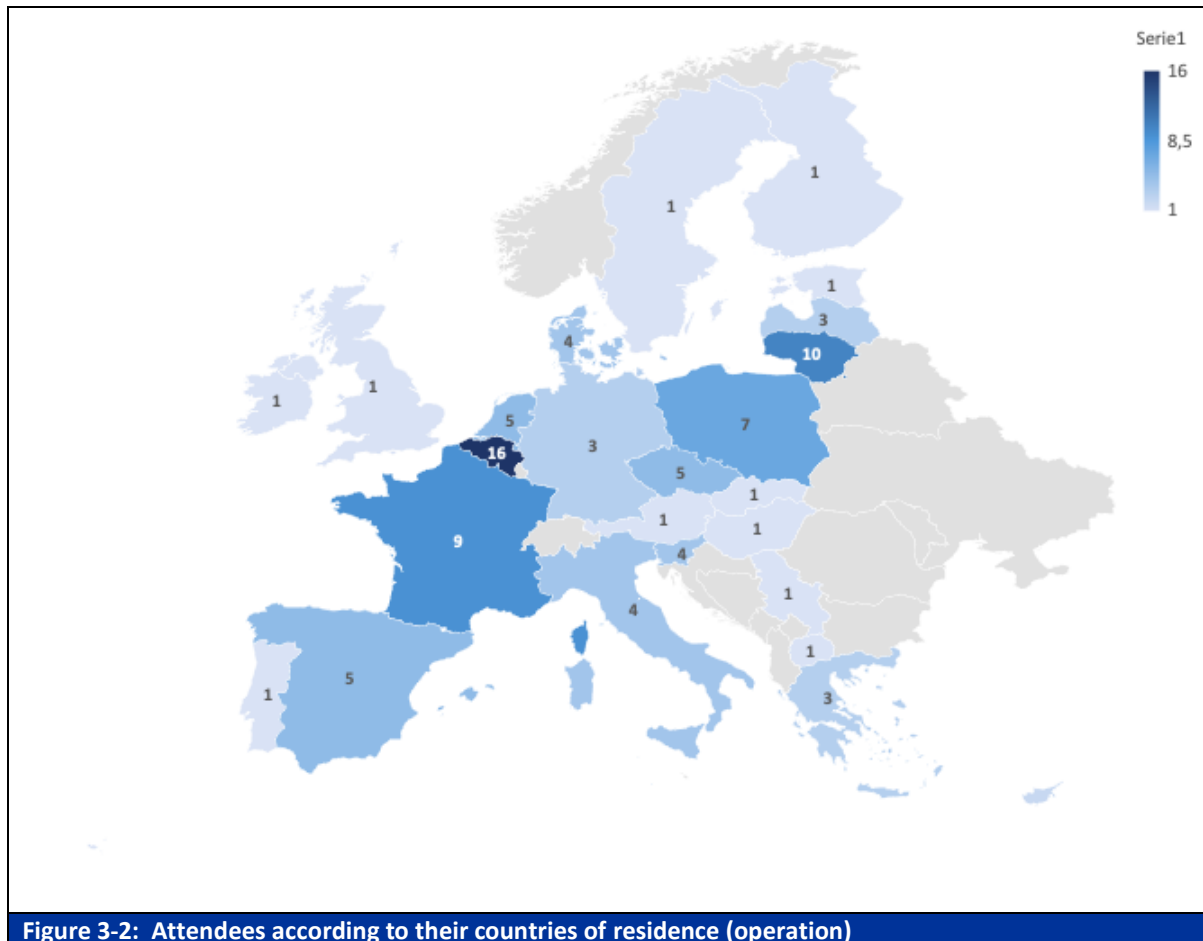


Figure 3-1: Attendees according to their affiliation

Figure 3-1 shows that the participants represented the diverse target audiences of the study. The attendees representing competent authorities (including national and regional authorities) prevailed (37% of the total attendees, 35 participants). However, a large participant group representing industry or trade associations category was also well represented, with 15 representatives attending the event.

A total of 28 countries were represented during the workshop. This number included twenty-three EU Member States, and 5 non-EU countries: Brazil, Serbia, USA, UK and North Macedonia. Figure 3-2 shows the number of participants attending the event based in Europe.



As shown in Figure 3-2, Belgium registered the highest number of participants, with 16 people joining the workshop from this country. This number includes, in addition to Belgian authorities, companies or associations, also EU level associations and EU institutions representatives.

4 Workshop discussions

This section describes the main themes that emerged in the two topic-specific discussions organised at the workshop:

- Management of asbestos waste in the EU: policies and practices, and
- Current and emerging technologies for the treatment of asbestos waste.

4.1 Management of asbestos waste in the EU: policies and practices

During the first discussion session on policies and practices of asbestos waste management in the EU, two speakers from the study team presented the study findings on management practices in two Member States: Germany and Denmark.

Stefania Butera (DTI) presented asbestos waste management practices in Denmark, focusing on the asbestos containing waste generated by construction and demolition works and outlining the major requirements that building owners, demolition companies and landfill operators have to comply with.

Olaf Dünger (Arcadis Germany GmbH) described asbestos waste management practices in Germany, presenting the provisions outlined in the new German Regulation concerning asbestos-containing waste (ACW) and the requirements to comply with before demolition and during remediation and maintenance work, as well as education and training provided to the workers.

To open up the discussion with the participants, four general questions were posed by the study team:

- What are the **most important elements of a national asbestos management strategy** in your opinion? Why are these elements important?
- What are the measures or actions in the existing national strategies or other initiatives on asbestos waste management that can be considered **best practice**? What can we learn from their implementation?
- What **challenges are currently faced** by EU Member States that have developed (are developing or want to develop) programmes and initiatives to support the implementation of their national strategies?
- Which elements should be part of a strategy at the **EU level**? Why do you think the EU action is needed?

Attendees had a lively participation in the discussion, both by intervening in the chat and by taking the floor. The points raised are summarised in the sections below.

4.1.1 Main elements of a national asbestos management strategy

During the discussion on the elements that are important for designing a successful asbestos waste management strategy, some participants focused on actions that should be taken to improve asbestos waste management at national level, while other participants emphasised the need to take into consideration a number of relevant factors. Figure 4-1 summarises the main topics that emerged in the discussion.

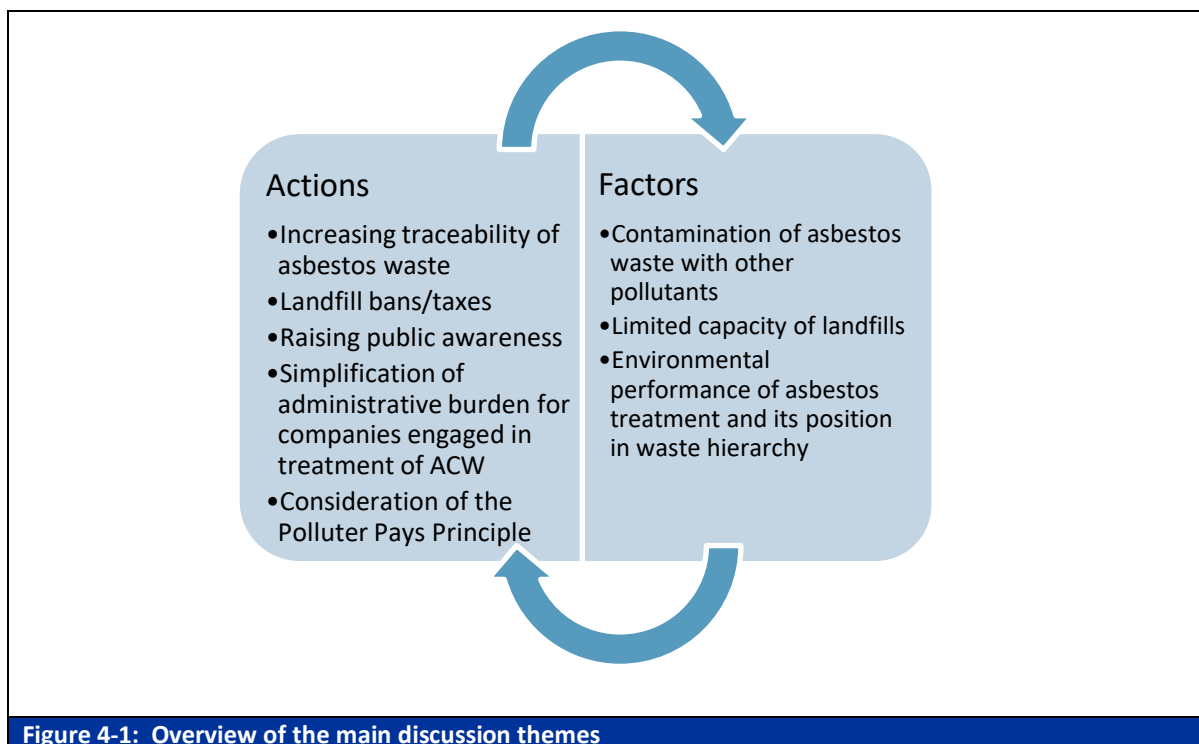


Figure 4-1: Overview of the main discussion themes

Participants identified five relevant actions that should be taken at the EU and national level.

- **Increasing traceability of asbestos waste.** A comprehensive mapping of asbestos waste (i.e. an asbestos cadastre) at EU and national level was identified as a very important element to increase the traceability of the waste. Better and more specific data should be collected, and there should be training and harmonisation at Member States level on the use of the List of Waste codes.
- **Potential introduction of specific landfill bans (e.g. on asbestos demolition waste) or landfill taxes.** The issue was raised and debated among participants, with some attendees arguing that such bans or taxes could be useful tools, stating that “a landfill tax that is high enough to penalise landfill, will make any treatment option more commercially attractive”. However, others believed that such measures could be too radical and may lead to unintended consequences. The participants emphasised that landfill taxes or bans can only be put in place once “there is a sufficient network of alternative treatments at reasonable prices”, otherwise decontamination works would be penalised and improper management or inaction to remove asbestos would be encouraged. Some of the participants expressed the opinion that landfilling of asbestos waste will remain relevant even in the presence of operational asbestos waste treatment technologies and maintained that in some cases landfilling will remain the only appropriate waste management option.
- **Increasing awareness at the household/private citizens level.** The lack of awareness among citizens often causes a significant problem of illegal dumping around urban centres, so raising public awareness is key. In relation to this, the availability and affordability of collection sites should be increased.
- **Administrative ease** should be granted to companies dealing with asbestos waste disposal, who often must deal with bureaucratic burdens which hinder the handling and management of the waste.
- **Consideration of the Polluter Pays Principle.** When considering the economic aspects of waste treatment and disposal, the discussion highlighted that, due to the prevailing economic conditions that govern waste management practices, a lot of the asbestos-containing waste

ends up in landfills. In this context, participants emphasised the vital importance of considering and applying the Polluter Pays Principle, which asserts that those responsible for creating pollution or generating waste should bear the associated costs and responsibility for its proper management and disposal.

Several attendees focused on key factors to be considered when making decisions on asbestos waste management.

The **impact of the presence of other pollutants** in asbestos waste should be taken into account, and a case-by-case impact assessment of asbestos-containing waste should be carried out. The presence of other hazardous substances might determine the options for waste processing and treatment. One participant drew a parallel between disposing ACW and the provisions of Part II of Annex V of the POPs Regulation that contains a list of inorganic or mineral waste in which there can be POP substances above the limits set out in Annex IV and for which Member States may allow that a non-destructive treatment is carried-out.

The **capacity for disposal and treatment** in each Member State should be considered when implementing new policies such as asbestos removal plans at the EU or national level to ensure the capacity to receive the waste is sufficient, considering that in many countries, the capacity for landfilling is reducing and new permits for landfilling are very limited and difficult to obtain.

A point was made that the **waste hierarchy** is also important. The whole Life Cycle Approach should be taken into account because some of the relevant treatment options might be very energy intensive. When studying the technologies for the destruction of asbestos, it is important to understand what their externalities are and how they compare with landfilling or among themselves.

4.1.2 Best practices

During the discussion on what existing national strategies or other initiatives can be considered best practice, participants provided ideas and suggestions on how some of the major issues related to asbestos waste management could be tackled, while others gave examples of a number of good practices that some Member States are already implementing. Figure 4-2 summarises the main points that emerged in the discussion.

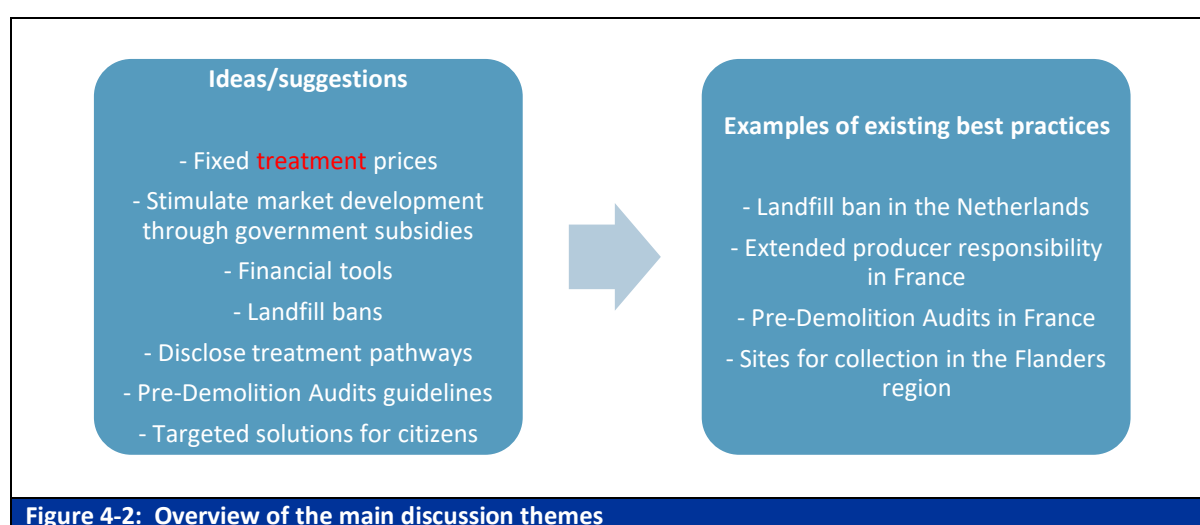


Figure 4-2: Overview of the main discussion themes

Participants underlined the need for a **pricing system** that does not encourage landfilling, as cheap landfilling may hinder the development of new technologies. In this context, the idea of having a **fixed**

price for landfilling and treatment options was proposed, with a participant stating that “the gap between low landfill prices and higher treatment costs needs to be bridged, to enable commercial operators to de-risk the investment for building a facility”.

The need to **stimulate market development** in terms of alternative solutions was discussed. A potential way to do this could be to get the traction going through government subsidies for the capital cost of building facilities, as a first step. Then the facilities could be scaled up and replicated until they reach the capacity to treat all the waste generated.

The introduction of new **financial tools** (e.g. taxes) or **landfill bans** may also be needed to achieve the transition towards new technologies and divert from landfilling.

Good practice example

In the Netherlands there is already a landfill ban defined in legislation that will become effective when 75% of the asbestos containing waste generated can be recycled, with the objective of having capacity to recycle 100% of the waste stream within a couple of years.

Good practice example

France has implemented an Extended Producer Responsibility (EPR) system for construction waste, which ensures that producers pay for or contribute to waste management. This includes asbestos waste from households, however the specific implementation details are yet to be clarified.

Pre-demolition audits (PDAs) were identified as an important element, however participants stated it is not clear whether the rules are always rightly implemented. **Clear guidelines** on how the PDA should be carried out are needed, such as on the number of samples that need to be taken to determine the presence (or absence) of asbestos.

Good practice example

In France, the assessment of asbestos presence in buildings is mandatory when selling a house or before any kind of demolition or renovation work.

Participants proposed the idea of having an obligation for companies to **disclose the treatment pathway** of the ACW they generate, as this may promote best practice and improve the waste traceability.

Participants suggested the introduction of more **targeted solutions for private citizens having to dispose of low quantities of asbestos waste from demolition/renovation works**. Incentive plans for the removal and disposal of asbestos waste are already implemented in some Member States (e.g. Italy), however these plans are usually reserved to companies. According to participants, it would be important to include **incentives for private citizens** in the national plans considering the high costs for removal and disposal sometimes disincentivise them from properly managing asbestos waste. Another solution that was mentioned was that private citizens could bring household waste to demolition companies that have the storage space to keep the asbestos-containing waste until they can deliver it to the landfill location.

The Commission underlined that the **separate collection obligation** for hazardous household waste set out in Article 20(1) of the Waste Framework Directive¹, which in some Member States or some regions has already been in place for some time, will be applicable in all EU Member States starting on 1 January 2025, and that includes asbestos waste.

Good practice example

The Flanders region in Belgium implemented a policy allowing households to dispose of non-friable (bound) asbestos resulting from Do-It-Yourself renovation work. This can be done by either taking the asbestos to a designated location or requesting a pick-up service from the municipality.

4.1.3 Challenges

Participants identified the major challenges related to asbestos waste management in the Member States, and some attendees described examples of issues occurring in their own countries. Figure 4-3 summarises the main topics raised in the discussion.

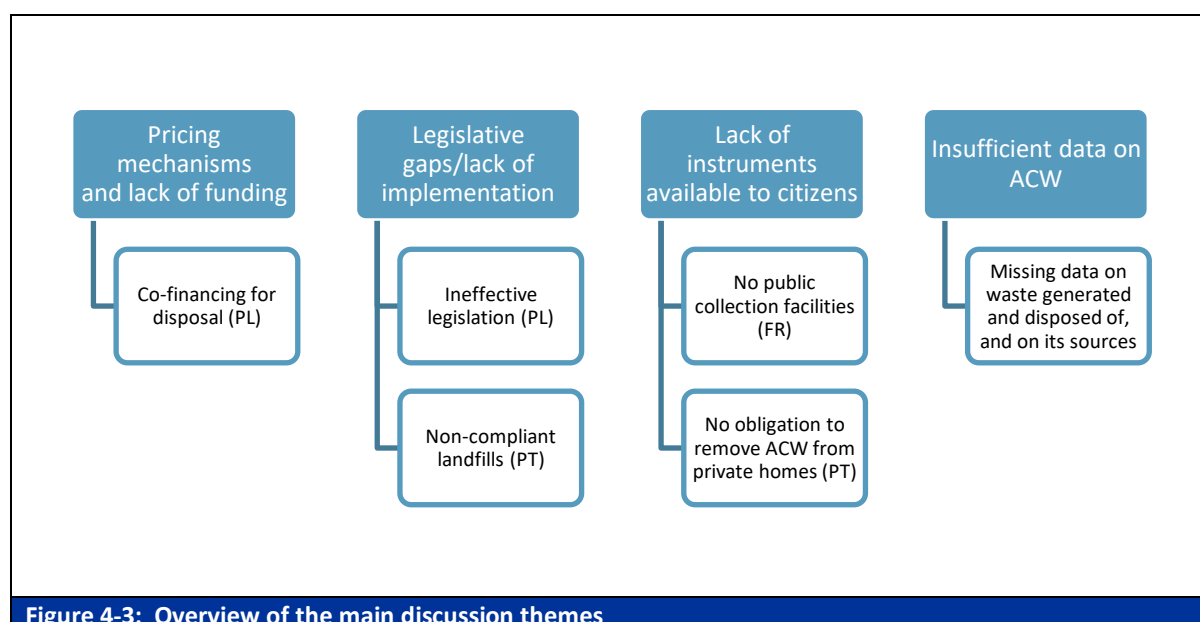


Figure 4-3: Overview of the main discussion themes

Participants highlighted four major challenges across the Member States:

- The current **pricing mechanisms** might encourage landfilling rather than the alternatives.
- The presence of **legislative gaps and the inadequate implementation** of existing regulations hinders the development and adoption of robust asbestos waste management practices.
- The **lack of viable instruments available to private citizens**, such as adequate waste collection facilities or pick-up programs specifically designed to cater to private sources of asbestos waste, complicates the proper handling and disposal of the ACW. This lack of accessible solutions places an additional burden on private individuals and raises concerns about the potential mishandling or improper disposal of asbestos waste originating from residential or small-scale sources.

¹ Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008L0098>

- At both EU and Member State level the **data gathered on asbestos waste generation, disposal and sources remains insufficient**. This knowledge gap limits the effectiveness of policymaking, planning, and resource allocation efforts, as well as the ability to evaluate the success of implemented initiatives or track progress in addressing the challenges associated with asbestos waste management.

A number of examples were presented to outline specific issues and challenges in different Member States.

- The primary challenges faced in Poland regarding asbestos management stem from **insufficient funding and ineffective legislation**. As per the current regulations, during renovation projects the state budget's co-financing program only covers the costs associated with dismantling and disposing of asbestos products. However, the burden of procuring new materials, such as a new roof, falls entirely on the building owner, necessitating additional financial resources.
- The **closure of a significant number of landfills** in Portugal stemmed from their failure to adhere to the applicable EU legislation. The landfills were found to be mixing non-friable asbestos waste with organic waste within the same landfill cells. Currently, Portugal only has three remaining landfills authorised to accept asbestos waste, leading to an escalation in prices for proper disposal and to an increase in illegal dumping activities.
- In Portugal, an additional concern arises from the disparity in regulations pertaining to asbestos removal between companies and public building owners on one hand, and private citizens on the other. The legislation mandates that companies and public building owners must be aware of the presence of asbestos in their structures and take appropriate measures for its removal. However, there is **no corresponding obligation for private citizens to remove asbestos from their homes**. This discrepancy becomes significant as a substantial portion of construction and demolition activities occurs at the household level. As a result, ACW generated from private residences often goes unnoticed and is susceptible to being illegally dumped. To address this issue, non-governmental organisations (NGOs) in Portugal have taken on the task of collaborating with local Chambers of Commerce to promote awareness among individuals.
- In France, households and small enterprises face a significant challenge when it comes to the proper disposal of waste. The issue arises from the **closure or non-operation of public collection facilities**, primarily due to the difficulties encountered in adhering to the stringent regulations imposed.

4.2 Current and emerging technologies for the treatment of asbestos waste

During the second discussion session on current and emerging technologies for the treatment of asbestos waste, two speakers presented their perspectives on asbestos waste treatment technologies.

Nicolas Humez, Chairman of Hazardous Waste Europe, underlined that the diversity of asbestos-containing waste must be considered to ensure adequate disposal. In the presentation, several aspects of asbestos waste management were emphasised:

- Complementarity of different management solutions, including landfilling;
- The importance of certifying the recovered materials to ensure they are free from asbestos fibres;
- Monitoring the pollutants produced in the waste treatment installations; and
- Safety and appropriate training of the treatment facility staff.

Jos Hofs, Chief Financial Officer at Asbeter Holding B.V., presented the work his company is currently doing in treating asbestos-containing waste. Asbeter developed the patented mechanochemical process that, according to the company and a recently obtained certification, completely dissolves asbestos fibres from asbestos cement and recovers carbon-neutral raw materials. This is achieved by a wet process, which creates an alkaline environment without the addition of chemicals.

Besides the mechanochemical process presented by Asbeter, a few other advanced asbestos waste treatment technologies were mentioned by the participants in the workshop. These include chemical treatment processes by Valame and De Dietrich/BlackAsbestos in France and thermal process by ARI Technologies in the UK. The representative of Valame, which uses a chemical process based on hydrochloric acid, said they were trying to have a service that is as easy as the service provided by landfills. De Dietrich's representative mentioned that the recovery of a valuable metal magnesium from asbestos waste was the key focus of their chemical process. The representative of ARI Technologies claimed that their technology had been existing for around twenty years and was well proven, but the commercial viability of the technology was lacking due to treatment costs that are higher than landfilling costs.

To open up the discussion with the participants, four general questions were posed by the study team:

- What are the **key characteristics of the technologies** that make them the most promising? Are there data (e.g. from pilots) to back up these advantages?
- What are the main **barriers to the commercialisation** of the technologies? Can you provide examples?
- What can be done to **overcome these barriers**? Can we draw any parallels with other technologies/sectors from which we could learn and get inspiration?
- What are the output **materials** obtained by the different treatment technologies? What are their safety profiles and potential uses? And do they have a market?

Attendees participated lively in the discussion, both by intervening in the chat and by taking the floor. The points raised are summarised in the sections below.

The discussion mainly focused on the **key characteristics of technologies** and **barriers to commercialisation**. Participants identified several characteristics that make treatment technologies viable and promising, as well as major issues that currently hinder the development and spreading of such technologies across Member States on the industrial scale. Figure 4-4 summarises the main topics that emerged in the discussion.

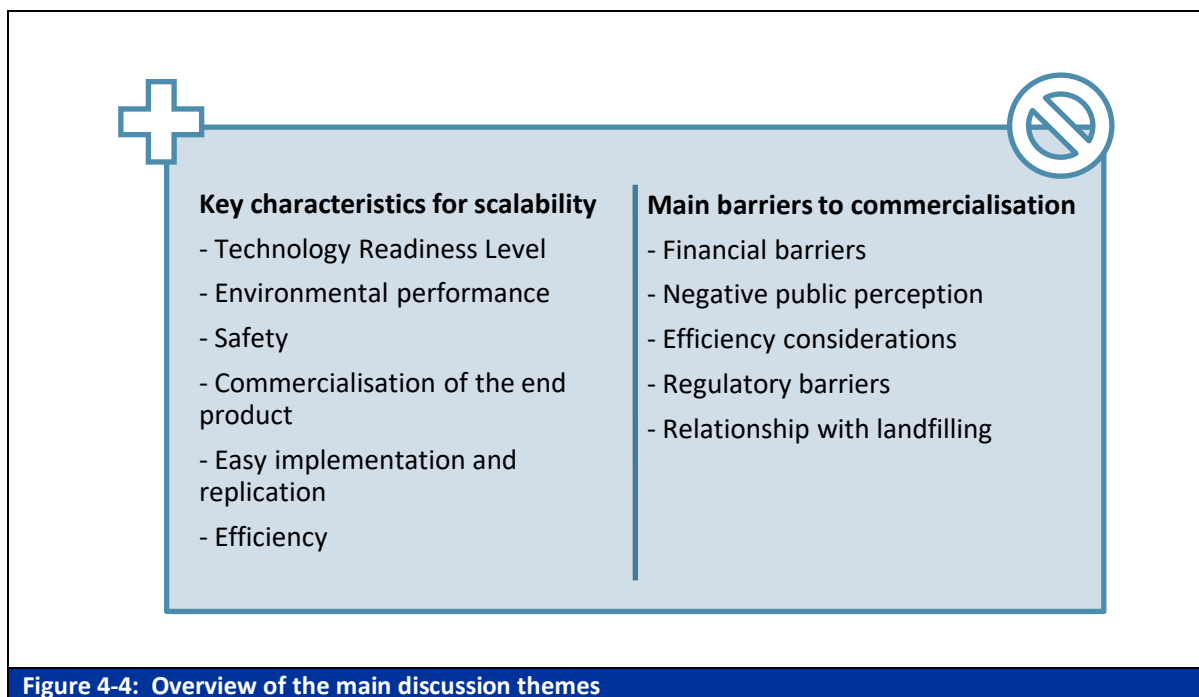


Figure 4-4: Overview of the main discussion themes

The participants highlighted six key characteristics of the promising asbestos waste treatment technologies. The **Technology Readiness Level** of the technology was mentioned as one of the key characteristics by several participants, as well as the **environmental performance** of the process. In particular, technologies should have a low energy consumption, low environmental footprint, and be eco-friendly.

Participants underlined the importance of **safety of the final product and the treatment process**. According to the participants, the treatment process must ensure that the end product is 100% fibre-free, and also that fibres are not released into the environment during the operations. Similarly, safety of the treatment process for workers and citizens living around the plants is critical. The participants emphasized the importance of transparency in regard to how and where the end products will be used.

Among the key characteristics of the promising treatment technology is a **market for the end product** of the treatment process. In turn, to enter the market successfully, output materials should be sold at a competitive price and be attractive to consumers. Some underlined this might prove especially difficult in some sectors, e.g., construction.

Asbestos treatment technologies should be **easy to implement** and as easy to work with as landfills. According to some participants, the technology can be given priority (over traditional methods, such as landfilling) if it provides a simple workflow for the players in the asbestos waste processing chain. The international spread of technology is influenced by the simplicity of its replication in different countries.

Several participants highlighted various aspects related to the **efficiency** of asbestos waste treatment. These aspects covered the **capacity** of plants to handle streams of asbestos waste, the maintenance cost of the technology, and its reliability. It was stressed that technologies should be able to handle the different types of asbestos waste.

A benchmark study “International Benchmark of Research and Development on the treatment of asbestos”² carried out in France was suggested during the discussion and will be further analysed.

The participants distinguished four **barriers** to the commercialisation of treatment technologies and how these barriers could be overcome:

- **Financial barriers** included the needs for substantial funding for the treatment technologies to reach the industrial scale. Drawing investments and incentives to fund the scalability of existing solutions and research on new ones is therefore fundamental. Here the collaboration between the governments, investors and the developers of asbestos treatment technologies is crucial. To ensure funds and investments, government support at the beginning of technology development project is important at Member State level. Government subsidies and funding can create the initial capital to build the installations and stimulate the market for these technologies. Government support is also important to show private investors that the technology is viable and scalable and that it can generate a return on investment.
- **Public perception** was identified as another major barrier to the commercialisation of asbestos waste treatment technologies and the introduction of recycled asbestos-free materials or products to the market. Similarly, as in other sensitive areas (e.g., nuclear energy), asbestos waste is often a source of public concern and negative perceptions. Materials or products developed as outcomes of asbestos waste treatment are considered with caution and raise safety concerns in society. It is therefore very important to work on changing the public perception by raising awareness of these technologies and about their safety (if proven).
- Efficiency considerations, such as high **energy consumption** can become a potential barrier. Due to the current geopolitical situation, energy prices are high or highly volatile, which may pose a barrier to the adoption of energy-intensive technologies for the treatment of asbestos waste. Moreover, the European Commission and the European Union Member States committed on long-term climate neutrality objectives, which again may pose a barrier to energy-intensive technologies, as the energy grids of many Member States still rely on the use of fossil fuel, and therefore wider adoption of the technologies would result in higher GHG emissions.
- **Regulatory barriers** play an important role. The participants highlighted current uncertainties and the lack of clarity associated with the definition of the End of Waste (EoW) status in Article 6 of Directive 2008/98/EC. In different Member States, the practices of assigning the EoW status vary. EoW status granted in one country may not be recognised in another Member State which can pose barriers for selling the end product on the international market. According to one participant, the lack of regulatory harmonisation and different standards in the EU are barriers to asbestos waste treatment companies to reach the industrial scale at the EU level.

The **relationship between landfilling and waste treatment technologies** was mentioned. Some participants believed that asbestos waste treatment technologies should offer competitive prices (as compared to landfilling) and regulatory measures to encourage circular solutions are necessary. However, there was no general agreement between the participants on the relationships between the treatment technologies and landfilling. Suggestions on how to overcome these barriers included the **harmonisation and standardisation** of how waste is managed in each Member State through EU level legislation, and the **involvement of all stakeholders**.

² http://www.plateforme-prda.fr/IMG/pdf/bi_rd_amiante.pdf

Other topics emerged in the discussion related to the potential **market use of the outputs** of the asbestos treatment process.

Participants identified the **recovery of raw materials** for which Europe is dependent on third countries as a potential market for output materials generated by the treatment of asbestos waste. In particular, one attendee outlined how asbestos can be a source of magnesium, which is a very valuable material for many industries including automotive and aircraft, and iron, which is valuable in the agriculture sector.

Through the **up-cycling of products**, recycled asbestos waste can be reused in the cement industry, but it could also reach new industries, such as the paint industry.

5 Conclusions and next steps

The workshop generated substantial interest among stakeholders. Over eighty percent of registered stakeholder attended the event resulting in nearly 100 participants from twenty-three EU Member States and five non-EU countries. The participants represented eleven stakeholder groups concerned with the issue of asbestos waste and taking part in asbestos waste management and treatment.

The views of stakeholders provided in this report may reflect the opinions of competent authorities and/or waste treatment technology companies. These two stakeholder groups prevailed among the participants. Furthermore, the topics of the workshop addressed issues that are most relevant to these stakeholders and reflect their role in the management and treatment of asbestos waste.

Several themes were vivid in both thematic discussions:

- **The composition of asbestos waste**, especially the contamination with pollutants and the presence of other components than asbestos, was mentioned in both discussions. This feature of asbestos waste has implications for both choosing the appropriate treatment method and the overall organisation of asbestos waste management. The mixed composition of asbestos waste may have implications for the market use of the outputs of the asbestos treatment process.
- **The transition from landfilling to asbestos waste treatment technologies.** A number of participants highlighted various issues related to shifting from landfilling asbestos waste to treatment options higher in the waste hierarchy. For instance, participants discussed market or regulatory measures to encourage the adoption of asbestos treatment technologies instead of landfilling when such technologies are in place. Whether these technologies will be overall more sustainable than landfilling was also a matter of discussion and a further issue for their wider adoption. It should be noted that the participants had different opinions concerning the role of landfilling in tackling the issue of asbestos waste and this topic generated debates and lively discussion.
- **Raising public awareness and working with public perceptions and behaviours.** This discussion related to the important role of the public in increasing the efficiency of asbestos collection (especially from households) and in accepting asbestos-free products resulting from the treatment processes.

Based on the workshop discussions, the study team collected information and examples to complement the literature review and legislation analysis. The next step of the study involves continuing stakeholder consultation activities. Semi-structured interviews will be arranged with different stakeholders. The workshop contributed to identification of the interviewees.

Annex 1 Organisations participating in the workshop

List of organisations attending the workshop

Table 1-2: List of affiliations of the workshop participants	
Organisation name	Country of residence
ABCOV Companies, LLC	United States of America
Amsterdam University of Applied Sciences	Netherlands
ARATC	Lithuania
Arcadis	Germany
ARI Global Technologies	United Kingdom
ARSO	Slovenia
Asbeter Holding B.V.	Netherlands
Asbeter Holding B.V.	Netherlands
ASEGRE	Spain
Assoambiente	Italy
Black Asbestos	France
BMAW	Austria
BRB Bundesvereinigung Recycling-Baustoffe e.V.	Germany
Brussels Environment	Belgium
Brussels Environment	Belgium
CCOO del Hábitat	Spain
Confederation of Danish industry	Denmark
D-nature B.V.	Netherlands
Danish Technological Institute	Denmark
Danish Technological Institute	Denmark
Danish Working Environment Authority	Denmark
Department of Environment	Cyprus
Embrapa Instrumentation	Brasil
Environmental Protection Agency	Lithuania
European Commission	Belgium
European Commission	Belgium
European Commission	Belgium
European Construction Industry Federation (FIEC)	Belgium
European Construction Industry Federation (FIEC)	Belgium
European Waste Management Association (FEAD)	Belgium
Federación de Industria, Construcción y Agro de la Unión General de Trabajadoras y Trabajadores (UGT FICA)	Spain
Fédération Française du Bâtiment (FFB)	France
Fédération Nationale des Travaux Publics (FNTP)	France
General Office of Building Supervision	Poland
Hazardous Waste Europe (HWE)	Belgium

Table 1-2: List of affiliations of the workshop participants

Organisation name	Country of residence
Institute of Plasma Physics	Czech Republic
Istituto Nazionale Assicurazione Infortuni sul Lavoro (INAIL)	Italy
Latvian Association of Waste Management Companies	Latvia
Leefmilieu Brussels	Belgium
Leefmilieu Brussels	Belgium
Ministerio para la Transición Ecológica y el Reto Demográfico	Spain
Ministry for the Ecological Transition and the Demographic Challenge	Spain
Ministry of Economic Development and Technology	Poland
Ministry of Energy	Hungary
Ministry of Environment	Lithuania
Ministry of Environment	Lithuania
Ministry of Environmental Protection and Regional Development	Latvia
Ministry of Environmental Protection and Regional Development	Latvia
Ministry of Finance	North Macedonia
Ministry of the Environment	Czech Republic
Ministry of the Environment of Estonia	Estonia
Ministry of The Environment, Climate and Energy	Slovenia
National Labour Inspectorate	Poland
National Public Works Federation	France
Oosten Project Management	Netherlands
Organisme Professionnel de Prévention du Bâtiment et des Travaux Publics (OPPBTP)	France
Polyeco Group	Cyprus
Polyeco Group	Greece
Polyeco Group	Greece
Polyeco Group	Greece
Public Health Authority of the Slovak republic	Slovakia
PWW DOO	Serbia
Rematt	Belgium
Rematt	Belgium
Remontes Soluções Ambientais Ltda	Brasil
Remontes Soluções Ambientais Ltda	Brasil
Research Institute for Buildings Materials	Czech Republic
RPA Europe	Italy
RPA Europe	Italy
RPA Europe	Lithuania
RPA Europe	Lithuania
RPA Europe	Lithuania
RPA Europe	Lithuania
RPA Europe Prague s.r.o.	Czech Republic

Table 1-2: List of affiliations of the workshop participants

Organisation name	Country of residence
Scientific Institute of Public Service (ISSeP)	Belgium
Scientific Institute of Public Service (ISSeP)	Belgium
Silesian Voivodeship	Poland
SIPTU	Ireland
Slovenian Environment Agency	Slovenia
Slovenian Environment Agency	Slovenia
SPW ARNE	Belgium
Swedish Environmental Protection Agency	Sweden
SYVED	France
University of Strasbourg	France
Urząd Marszałkowski Województwa Małopolskiego	Poland
Urząd Marszałkowski Województwa Małopolskiego	Poland
Urząd Marszałkowski Województwa Małopolskiego	Poland
VALAME	France
VALAME	France
Vilnius County Waste Management Centre	Lithuania
VšĮ Šiaulių regiono atliekų tvarkymo centras	Lithuania
VTT	Finland
Výzkumný ústav stavebních hmot, a.s.	Czech Republic
ZDB German Construction Confederation	Germany
ZERO	Portugal



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