Policy Brief

NEW-MINE

EU TRAINING NETWORK FOR RESOURCE RECOVERY THROUGH ENHANCED LANDFILL MINING

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2nd ELFM Seminar in the European Parliament: 5 Lessons Learned

Why we need to develop a broad Dynamic Landfill Management strategy and vision for Europe's 500,000 landfills

European Commission

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Executive Summary:

- The Second ELFM Seminar in the European Parliament took place on November 20, 2018. More than 50 directly involved stakeholders from the European Parliament, the European Commission, regional Public Bodies, industry and academia interactively debated the need to develop a clear vision on the management and mining of Europe's 500,000+ landfills.
- **Lesson Learned #1:** The ELFM Amendment of the Landfill Directive was rejected by the European Council in May 2017 as ELFM is a red line for the Eastern European Member States that have other, more pressing priorities in waste management, such as the avoidance of landfilling and the setting up of basic recycling schemes.
- **Lesson learned #2:** The participants agreed that the (revised) EU Landfill Directive has a number of blind spots. It has no bearing on the majority of Europe's 500,000 landfills as they predate the Directive (1999). As regards the minority of sanitary landfills, for which it was created, it has no answer for the long-term liabilities, as aftercare funds are underfunded, making any kind of future remediation and/or mining activity less attractive.
- **Lesson learned #3:** There was a consensus that the way forward is to prioritise the incorporation of the more comprehensive, multi-phased concept of Dynamic Landfill Management into European legislation rather than focussing only on its most ambitious part, i.e. Enhanced Landfill Mining.
- **Lesson learned #4:** It was agreed there is an urgent need for a comprehensive definition of the concept Dynamic Landfill Management (DLM), which should capture various dimensions. First of all, DLM refers to the dynamic view on landfill management, i.e. the management of any given landfill needs to smartly change and adjust over time. Secondly, DLM needs to offer an integrated framework, satisfying multiple objectives, ranging from pollution prevention, land reclamation and restoration, creation of new landfill void space, interim use of the landfill surface, to the recovery of materials and energy resources. Thirdly, a DLM definition needs to highlight the need for a cross-cutting approach with respect to distinct European policies and legislations. The task to develop a broadly-supported definition for DLM is given to the Interreg Europe COCOON team.
- **Lesson learned #5:** It was agreed that Enhanced Landfill Mining (ELFM) remains a highly valuable concept, albeit as one specific, more advanced component within the broader DLM concept. The political acknowledgement of the resource recovery-driven ELFM concept remains relevant, in line with Europe's Circular Economy Action Plan.

First ELFM Seminar in the EP (20 October 2015)

From the First to the Second ELFM Seminar in the European Parliament

On October 20, 2015, two Flemish MEPs (Vautmans & Demesmaeker) organised the first ever Seminar on Enhanced Landfill Mining (ELFM) in the European Parliament, in collaboration with EURELCO, i.e. the European Enhanced Landfill Mining Consortium. The Seminar featured speakers of the EC, the EP, along with leading actors representing industry, academia and public bodies. The seminar was attended by almost 100 people who debated the landfill (mining) situation in Europe. The meta-conclusion of the event was that the European Union urgently requires thorough inventories of its landfills and needs to develop a clear long-term vision on the management and mining of its landfills. One can download the event report here: URL.

Three years after the First Seminar, the Second Seminar was organised in the European Parliament by MEP Hilde Vautmans (ALDE Group) in collaboration with EURELCO, Cleantech Flanders, SIM² KU Leuven and 3 EU-funded landfill management/mining-related projects: EU MSCA-ETN NEW-MINE, Interreg Europe COCOON and Interreg NWE RAWFILL. In this case, a more interactive debate formula was chosen and the scope was broadened from Enhanced Landfill Mining-only to a broader view on Dynamic Landfill Management (DLM).

In contrast to the First Seminar, which still had a very Flemish/Belgian orientation, the Second Seminar provided a truly European perspective. Lessons learned in distinct EU regions and Member States were shared and discussed in great depth (see Text Box Programme and Presentations). All stakeholders were also invited to send their testimonial of the event. A selection of these can be found throughout this Policy Brief, as they provide a clear view on the achieved consensus with respect to the Lessons Learned, summarised in the Executive Summary.

Second ELFM Seminar in the EP (20 November 2018) (Photo: Copyright 2018 EU/EP):

Programme and Presentations

- Keynote intro by **MEP H. Vautmans** (ALDE): download speech here
- Retrospective by **P.T. Jones** (EURELCO Coordinator & EU Horizon 2020 MSCA-ETN NEW-MINE) (download presentation here)
- Intros by **U. Stock** (LfU Brandenburg, Germany), **E. Wille** (OVAM, Belgium) & **C. Neculau** (SpaQue, Belgium) on lessons learned on landfill management and mining policies/technologies in Europe (resp. COCOON & RAWFILL) (download presentation on COCOON-RAWFILL here)
- Intro by **Y. Tielemans** (Group Machiels) on barriers & opportunities for private actors willing to undertake ELFM projects (cf. Closing the Circle case) (download presentation here)
- **Debate I: Short-term opportunities for landfill management (e.g. interim use) and mining, featuring:** COCOON/RAWFILL partners & stakeholders: **G. Coca** (Junta de Andalucia, Spain), **Alexis De Mey** (Ministry of the Environment, Wallonia Region, Belgium), **C. Wolf** (TH Köln, Germany), **U. Stock** (Landesamt für Umwelt des landes Brandenburg, Germany), **J.F. Mars** & **F. van de Sande** (Rijkswaterstaat, Netherlands), **H. Scharff** (Afvalzorg, Netherlands).
- Intro by **MEP M. Demesmaeker** (ECR, Shadow Rapporteur Landfill Directive – URL) on ELFM & Landfill Directive
- **Debate II: EU legislation/policies (LFD, Soil Directive, CE, climate targets) and landfill management and mining benefits, with interventions from:** EC: **M. Nyberg** (GROW), **S. Happaerts** (REGIO); EP: **M. Demesmaeker** (Belgium, ECR), **H. Vautmans** (Belgium, ALDE); Academics: **J. Krook** (EU NEW-MINE, Linköping Univ., Sweden), **S. Wagland** (EU SMARTGROUND, Cranfield Univ., UK).
- Closing statement by **MEP H. Vautmans** (ALDE)
- **Moderator: V. Dries** (Adviser Flemish Government, Cabinet Liesbeth Homans, Expert on ELFM)

Photos (Copyright 2018 EU/EP)

Lesson Learned #1: The ELFM Amendment of the Landfill Directive was rejected by the European Council as ELFM is a red line for the Eastern European Member States that have other priorities in waste management

During the first panel debate considerable attention was devoted to finding explanations for the 2017 rejection of the so-called ELFM Amendment to the Landfill Directive in the trilogue negotiations in May 2017. Let us recap. This Amendment was previously introduced by MEP Mark Demesmaeker. It stated *"The Commission shall further examine the feasibility of proposing a regulatory framework for enhanced landfill mining so as to permit the retrieval of secondary raw materials that are present in existing landfills. By 31 December 2025 Member States shall map existing landfills and indicate their potential for enhanced landfill mining and share information."* The Amendment was adopted by the European Parliament on March 14, 2017, which at that time was considered as a major milestone for the proponents of the ELFM concept. Unfortunately, a couple of months later, this ELFM Amendment was blocked by the European Council during the trilateral meeting between the Parliament, the Council and the Commission.

The reasons for the reluctance by the Council to accept a formal reference to the ELFM framework were widely discussed by the participants of the 2nd ELFM Seminar. However, it was a pity that, despite numerous invitations by MEP Hilde Vautmans, to various persons of DG ENV, the Directorate that is the competent authority for the Landfill Directive, was not represented at the Seminar. The views of various MEPs and EC representatives (DG GROW,

DG REGIO) were nevertheless heard, as well as those of multiple landfill experts from regional and national public bodies. MEP Hilde Vautmans summarised the discussion as follows: *"Talking about ELFM is a red line for the Eastern European Member States that have other priorities in that field, think of waste and landfill reduction. As other European Member States - more advanced when it comes to waste management - fear that a package will not pass if a concept like ELFM is included, we end up with a Landfill Directive that does not refer to ELFM.*

Lesson Learned #2: The EU Landfill Directive suffers from multiple blind spots

Subsequently, a number of landfill experts discussed the merits and pitfalls of the (revised) Landfill Directive. The following conclusions were made. First of all, the Landfill Directive does not have anything to say on the fate of Europe's historic landfills, which predate the Landfill Directive (1999) and which form the majority (i.e. > 90%) of Europe's 500,000 landfills. The existence of such a vacuum is mind boggling.

Furthermore, even for those landfills for which the Landfill Directive is actually relevant, serious flaws were exposed during the Seminar. The (revised) Landfill Directive is still based on a static view on (sanitary) landfills. In this paradigm, landfills are considered as final repositories of waste. They need to be monitored; the waste needs to be contained with a multi-barrier system, all in view of a risk-based approach. The minimum period of 30 years of monitoring, however, was called into question by a number of landfill management experts, who indicated that the monitoring period will need to be much longer than 30 years. This view was summarised by the renowned landfill expert Heijo Scharf (Afvalzorg, Netherlands): *"It is amazing how many people believe that monitoring and aftercare of EU landfills can stop. Funding needs to cover at least 30 years. But monitoring only stops when a landfill poses no hazard to the environment any more. An assessment method doesn't exist. Therefore, landfills in the EU cannot be discharged from aftercare and monitoring."*

It was agreed by the landfill experts that the Landfill Directive does not have an answer for the long-term liabilities, as aftercare funds are underfunded, making any kind of future remediation/mining activity less attractive. The long-term liability issue becomes increasingly important as new threats, such as climate change, will impact landfills in coastal and alluvial areas, requiring remediative action in the future.

Lesson Learned #3: Prioritise the incorporation of the more comprehensive, multi-phased concept of Dynamic Landfill Management into European legislation rather than pushing an ELFM-only approach

From a legal point of view, the present landfill paradigm represents a static, environmental risk-based view on landfills. Unfortunately, a plethora of new opportunities, such as the interim use and integrated revitalisa-

"WTF Landfills. Indeed, what's the future of landfills? Should we eternally invest in maintaining the status quo or develop a dynamic management, bringing landfills in harmony with their environment? All current schemes of Circular Economy expel (500,000+) landfills. That's breaking your own rules. Each landfill should be at least assessed in view of a re-integration in the circular system of resources (materials, energy, land). The future implies dealing with the past, not walking away from it. This seminar was inspiring and a driver we needed."

Eddy Wille (Flemish Public Waste Agency, Belgium)

MEP Hilde Vautmans (ALDE Group) @ Second ELFM Seminar in the EP (20 November 2018) (Photo: Copyright 2018 EU/EP):

Heijo Scharff @ Second ELFM Seminar in the EP (20 November 2018) (Photo: Giorgian Dinu/KU Leuven)

tion of landfills and their surfaces, are basically ignored in this paradigm. Such interim uses (solar parks, golf courses, nature parks…) could, however, generate revenues for aftercare, remediation and/or mining activities in the longer term. Furthermore, they can offer public benefits such as social cohesion, public health and sheltered employment. This was nicely illustrated by Prof. Paul Bardos (University of Brighton, UK) who referred to the Lady of the North example in the UK. This is an old landfill site, which has been converted into a country park and landscape sculpture that is open for the public from dawn til dusk each day. This example testifies to the public benefits that can be generated.

Amongst the participants of the Second ELFM Seminar there was on overwhelming consensus that the landfill paradigm needs to change from the (Landfill Directive-linked) static view to a comprehensive, long-term, multi-phased Dynamic Landfill Management (DLM) vision, in which Enhanced Landfill Mining (ELFM) is only the icing on the cake for some specific landfills in specific situations.

Such a new DLM paradigm should have strategies and solutions for all of Europe's landfills, not only for the (minority of) Landfill Directive-compliant operational and recently-closed sanitary landfills but also for the historic landfills and waste dumps predating the Landfill Directive. This is key as the latter form the majority of Europe's 500,000+ landfills. This paradigm should be aligned with the Circular Economy paradigm, rather than opposing it. Eddy Wille (Flemish Public Waste Agency) summarised it as follows: *"What's the future of landfills? Should we eternally invest in maintaining the*

"It is amazing how many people believe that monitoring and aftercare of EU landfills can stop. Funding needs to cover at least 30 years. But monitoring only stops when a landfill poses no hazard to the environment any more. An assessment method doesn't exist. Therefore, landfills in the EU cannot be discharged from aftercare and monitoring."

Heijo Scharff (Senior Advisor, AFVALZORG, The Netherlands)

"I was very happy with the interactive debate and the participants acknowledging that the current Landfill Directive is actually not obligatory for more than 450,000 historic landfills in Europe. This makes our work on the COCOON project, where we aim to improve the regional policy on landfill management, even more relevant."

Annick Vastiau (Cleantech Flanders, Belgium)

Paul Bardos (University of Brighton, UK) @ Second ELFM Seminar in the EP (20 November 2018) (Photo: Giorgian Dinu/KU Leuven):

Eddy Wille (Flemish Public Waste Agency, Belgium) @ Second ELFM Seminar in the EP (20 November 2018) (Photo: Copyright 2018 EU/EP):

"During the seminar everyone agreed that a new approach is required if we want to have ELFM on the European agenda. Making policy, certainly at European level, is a difficult balancing act. Talking about ELFM is a red line for the Eastern European Member States that have other priorities in that field, think of waste and landfill reduction. As other European Member States - more advanced when it comes to waste management - fear that a package will not pass if a concept like ELFM is included, we end up with a Landfill Directive that does not refer to ELFM. So first things first. And in the case of ELFM that means we should first aim to incorporate the concept of dynamic landfill management into European legislation. Given the current attention that goes to the circular economy, I am convinced that we will succeed in this."

Hilde Vautmans (MEP, ALDE Group) – Host 2Nd ELFM Seminar

"Several ongoing EU-funded projects show that there is still much to learn about how to manage the EU's many landfills in a sustainable and innovative way. These experiences are especially relevant as the European Commission is putting more emphasis on the transition to a circular economy, including in its proposals for the 2021-2027 cohesion policy. This will help Member States and regions to manage the transition and reap its benefits for regional development."

Sander Happaerts (EC DG REGIO, Belgium)

status quo or develop a dynamic management, bringing landfills in harmony with their environment? All current schemes of Circular Economy expel (500,000+) landfills. That's breaking your own rules. Each landfill should be at least assessed in view of a reintegration in the circular system of resources (materials, energy, land). The future implies dealing with the past, not walking away from it."

When the legal aspects of this DLM perspective were discussed, it became clear that the current EU legislation does not accommodate this shift in any way (yet). This led to the question on which strategy needs to be followed. Rather than focussing only on its most ambitious part, i.e. Enhanced Landfill Mining, which is difficult to grasp for many EU Member States who have other, even more pressing waste management problems to solve, it would be better to integrate the more encompassing DLM framework in EU legislation. The DLM approach can offer more straightforward solutions now, without major investments, while even creating some revenues from interim uses. MEP Hilde Vautmans summarised it as follows: "So first things first. And in the case of ELFM that means we should first aim to incorporate the concept of dynamic landfill management into European legislation. Given the current attention that goes to the circular economy, I am convinced that we will succeed in this."

Lesson Learned #4: Prioritise a sound definition for the Dynamic Landfill Management concept

One of the key conclusions from the first panel debate about competing landfill paradigms was that there is an urgent need to come up with a 21th century-oriented view on DLM, which is closely integrated with other EU Policy Goals. Apart from the Circular Economy targets, also climate change mitigation and adaptation, as well as regional development and smart specialisation strategies were mentioned by multiple participants, including Sander Happaerts (DG REGIO).

Several experts stressed the importance of the sustainability aspect of the DLM paradigm. John Laurence Esguerra, Linköping University (Sweden) and Early Stage Research in the NEW-MINE project, stated it as follows: *"The event highlights the need for a shared sustainability perspective regarding dynamic landfill management. Beyond resource recovery, a broader ecosystem services revitalisation including interim land use (…) has to be considered. This broad sustainability perspective with long temporal aspect could be a tricky concept to grasp, but it should also not limit the facilitation of this field through an explicit political legitimation."*

Other experts referred to the transversal character of the DLM paradigm, which also creates legislative difficulties as legislation is often stuck in non-communicating silos. Yves Tielemans (Group Machiels): *"Being a very transdisciplinary topic, it is not a trivial question which EU Directive should stipulate the definition and framework for this topic, but I believe all the participants agreed that we need an unambiguous definition on an EU level."*

Sander Happaerts (DG REGIO, EC) @ Second ELFM Seminar in the EP (20 November 2018) (Photo: Giorgian Dinu/KU Leuven):

One of the key actions that was agreed at the Seminar, was the need to prepare, together with the stakeholders from the Interreg Europe COCOON project, an unambiguous, comprehensive definition of the term "Dynamic Landfill Management", which can then be used by the European Institutions in future legislative work.

Such a comprehensive definition for DLM should capture the different aspects that were highlighted by the Seminar participants. First of all, DLM needs to refer to the dynamic view on landfill management, i.e. the management of any given landfill needs to smartly change and adjust over time. Secondly, DLM needs to offer an integrated framework for the management of landfills, satisfying multiple objectives, ranging from pollution prevention, land reclamation and restoration, creation of new landfill void space thereby avoiding the development of new landfills, interim use of the landfill surface for more productive purposes, to the recovery of materials and energy resources, while respecting the most stringent social, ecological and health criteria (i.e. ELFM). Thirdly, a DLM definition needs to highlight the need for a cross-cutting approach with respect to distinct European policies and legislations in the broadest sense (Waste and Resource Management, Climate change, Flooding, Soil sealing, No net land take, Biodiversity).

To conclude, such a comprehensive, dynamic, integrated and cross-cutting DLM concept provides a potential solution for tackling the long-term liability issue for landfills, for which there is currently no real solution (see **Lesson Learned #2**). Furthermore, the DLM concept – which considers "land(fills) as a resource" – is fully in line with EU-needs to restore degraded land and encourage land recycling, in particular by supporting the regeneration of brownfields such as landfill sites.

Lesson Learned #5: The resource-recovery driven ELFM concept should be seen as one specific, more advanced component in the broader "Dynamic Landfill Management" approach

The second panel debate covered the question about the relation between Enhanced Landfill Mining (ELFM) and the current landfill paradigm and the associated Landfill Directive. The working definition of ELFM remains the one published in 2013 in the Journal of Cleaner Production (Jones et al.): *"the safe exploration, conditioning, excavation and integrated valorisation of (historic, present and/or future) landfilled waste streams as both materials (Waste-to-Material) and energy (Waste-to-Energy), using innovative transformation technologies and respecting the most stringent social and ecological criteria."*

As discussed in a previous NEW-MINE Policy Brief by Joakim Krook et al.(November 2018), in the current, risk-based landfill paradigm the possibility of recovering materials and energy from present and historic landfills is obstructed, as the landfilled waste is deposited and shielded ad infinitum. Landfilling implies that the landfill

"During the seminar, it became clear to me that ELFM forms part of a wider landfill management strategy where the interim use of landfills is able to generate both economical, ecological as well as societal benefits. Being a very transdisciplinary topic, it is not a trivial question which EU Directive should stipulate the definition and framework for this topic, but I believe all the participants agreed that we need an unambiguous definition on an EU level."

Yves Tielemans (Project Manager Closing-the-Circle Project, Group Machiels, Belgium)

"*The most important goal of dynamic landfill management is the creation of a safe landfill, even in the distant future. For me, dynamic landfill management means finding the most suitable route, taking into account the specific landfill and the environment. The proven technologies of risk-based approaches should have their place as well as innovative ideas. Landfill mining is an important component, although landfill mining has not been implemented in the European Landfill Directive.*"

Ulrich Stock (LfU Brandenburg, Germany)

"My interest is in the wider sustainability performance and value of different approaches to brownfields management, especially for "soft" (i.e. not built) re-use. I learnt how landfill mining can be used as part of brownfield rehabilitation, and the importance of its "interim" management."

Paul Bardos (R3 environmental technology ltd & University of Brighton, UK)

"The event highlights the need for a shared sustainability perspective regarding dynamic landfill management. Beyond resource recovery, a broader ecosystem services revitalisation including interim land use (e.g. extension of active landfills' lifespan as a short term value and eventual reuse of land especially for old landfills as a long term value, both for supporting human and biodiversity proliferation) has to be considered. This broad sustainability perspective with long temporal aspect could be a tricky concept to grasp, but it should also not limit the facilitation of this field through an explicit political legitimation."

John Laurence Esguerra, Linköping University (Sweden) (ESR in EU MSCA-ETN NEW-MINE)

represents a final destination for the discarded materials. This is a waste as Europe's 500,000+ landfills contain huge amounts of base metals, waste fuel, construction materials etc. and in the light of our most ambitious visions and goals of a circular economy, just neglecting these dormant resources does not seem as a very sound and sustainable option. On the contrary, in a dynamic view on landfills, a new vision appears, where landfilled materials can be reintegrated into the (circular) economy, if and when the time is right. This was the background for the EP-approved ELFM Amendment by MEP Mark Demesmaeker (see **Lesson Learned #1**).

In her speech MEP Hilde Vautmans reminded the Seminar participants that in June 2018 she asked a new Parliamentary Question to the Commission (E-003580/2018) to clarify its position with respect to ELFM after the rejection of the ELFM Amendment. The question was asked in the knowledge that in recent years the EC – DG GROW in particular – has been quite supportive to the ELFM concept. Apart from funding several ELFM-related EU projects, in 2018, the EC also organised a high-profile EIP Raw Materials workshop *"Enhanced Landfill mining for critical raw materials"*, which was stressed in the contribution by Maria Nyberg (EC, DG GROW).

The EC's answer to the Parliamentary Question stated *"… the [Landfill] directive does not specifically regulate landfill mining and the Commission does not currently envisage proposing to amend the directive in this regard. Landfill mining is, however, not prohibited, if carried out in line with EU legislation on waste (…)"* Although this is the first time the Commission somehow endorses the use of ELFM as a concept – which should be considered as a key milestone for the proponents of ELFM – the words *"not prohibited"* are not saying the same as *"facilitates"*, dixit MEP Hilde Vautmans.

The problematic character of the fact that, despite 10 years of ELFM activities, there is still no formal, legislative definition nor any formal reference to the resource-recovery-driven ELFM approach in EU Policy documents, was reiterated by a number of speakers during the Seminar. It was agreed that such a political acknowledgement of ELFM, as one possible approach, for some landfills, is key to progress in this area, as was also pointed out in the 2018 NEW-MINE Policy Brief.

However, what became evident from the discussions is that such an ELFM definition and endorsement should be integrated as one specific, more advanced component in the broader "Dynamic Landfill Management" approach, in line with Europe's Circular Economy Action Plan. This will be taken up as a key action for the COCOON network, which needs to come up with a broadly supported, comprehensive definition of Dynamic Landfill Management, which is to include an unambiguous, eco-friendly, socially-aware description of a resource recovery-driven ELFM element.

Maria Nyberg (DG GROW, EC) @ Second ELFM Seminar in the EP (20 November 2018) (Photo: Giorgian Dinu/KU Leuven):

The European Commission acknowledges in the Circular Economy Action Plan that there is a potential for recovery of Critical Raw Materials from landfills and/or mining waste provided that it is carried out in line with EU legislation on waste. We will present a more detailed analysis of this topic in the first quarter of next year. More precise commitments and objectives of the continued work on Circular Economy will be outlined by the next College of Commissioners".

Maria Nyberg (EC DG GROW, Belgium)

"*Is Landfill mining a good idea? The answer is obviously affirmative. The ELFM Seminar at the European Parliament gave us an overview with the current on-going projects and two panel debates with high-quality experts. Landfill mining is an opportunity to redevelop and convert landfill for useful land-use purpose and, in the meantime, to recover secondary raw materials. This is a perfect illustration for curving the line of our conventional economy in order to reach the circular one. There are of course many steps to achieve on technical, social, political and regulatory framework aspects but I am confident that efforts will pay. Thanks again to ELFM seminar organisers and participants for making that nearly-new concept come true.*"

Alexis De Mey (Ministry of the Environment, Wallonia Region, Belgium)

"ELFM has progressed significantly since the last seminar in the European Parliament. It is imperative that ELFM maintains pace as we work towards commercial operations where ELFM will make an undoubted and substantial contribution to the security of critical raw materials. Legal and political support is paramount to achieving this goal"

Stuart Wagland (Cranfield University, UK)

"I found the seminar most interesting and am very impressed with the dedication of European Enhanced Landfill Mining Consortium to push the agenda forward and ensure that ELFM is recognised in policy. Although the UK is set to leave the EU, we will continue to look to our European partners for the inspiration, dialogue and guidance on what we see as an integral part of the overall sustainable world and resources challenge."

Richard Thompson (Recircled Resources Ltd, UK)

"*Having the opportunity to participate in the 2nd Seminar on Enhanced Landfill Mining at the European Parliament gave me a very good insight into how a very close interaction between society, authorities, industry and research is crucial for the implementation of innovative technologies in a successful manner.*"

Juan Carlos Hernández Parrodi (Renewi, Belgium) - ESR in EU MSCA-ETN NEW-MINE)

"*The interactive discussion among experts of the field, motivated me even more to maintain my research and contribute as much as I can to the development of a dynamic landfill management strategy for Europe's landfills. Connecting interdisciplinary bridges and bringing all the knowledge together, this seminar showed that Enhanced Landfill Mining has a great potential to achieve sustainable development in the framework of a circular economy, where the depletion of the resources is the driving force for a better future.*"

Georgia Flesoura (KU Leuven, Belgium) - ESR in EU MSCA-ETN NEW-MINE)

About the authors

Peter Tom Jones is a KU Leuven IOF (Industrial Research Fund) Senior Research Manager in the field of Urban/Landfill Mining and Sustainable Metallurgy (SIM² KU Leuven). He is coordinator and/or valorisation officer of a number of KU Leuven, Flemish and EU-wide projects and consortia in the field of recycling, metallurgy and Urban/Landfill Mining. He is the General Coordinator for the European Enhanced Landfill Mining Consortium (EURELCO). Jones coordinates the EU H2020 MSCA-ETN NEW-MINE project on ELFM.

Eddy Wille is Senior advisor – geologist at the Flemish Public Waste Agency (OVAM, Department of Soil Management) and negotiator and representative of the Flemish government in Brownfield covenant projects. Since 1991, he's involved in the Flanders soil remediation policy and pioneering in OVAM's ELFM-programme. He is the OVAM-representative in EURELCO and collaborator in the Interreg projects COCOON and RAWFill. He's also member of the Advisory board of EU MSCA-ETN NEW-MINE.

Joakim Krook is Associate Professor in Industrial Ecology at the Division Environmental Technology and Management, Linköping University (Sweden). He is specialised in multidisciplinary systems analysis research on recycling strategies and landfill and urban mining. He is Steering Committee Member of EURELCO and editor of the special issue entitled "Urban and Landfill Mining: emerging global perspectives and approaches" in Journal of Cleaner Production (2013). He is Principal Investigator for Linköping University in the EU MSC-ETN NEW-MINE project.

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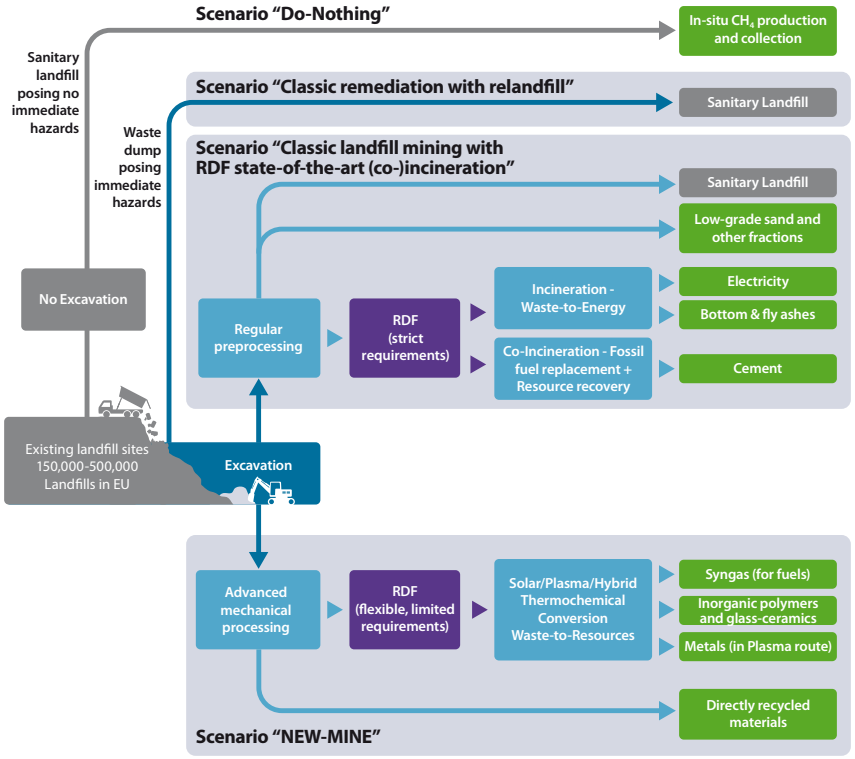
NEW-MINE
EU TRAINING NETWORK FOR RESOURCE RECOVERY THROUGH ENHANCED LANDFILL MINING

Key project information:
Project type: H2020 MSCA-ETN
Project duration: 4 years (01/09/2016 to 31/08/2020)
Website: http://new-mine.eu/
EU contribution: €3.85 m
Coordination: KU Leuven

Europe has somewhere between 150,000 and 500,000 landfill sites, with an estimated 90% of them being "non-sanitary" landfills, predating the EU Landfill Directive of 1999. These older landfills tend to be filled wth municipal solid waste and often lack any environmental protection technology. In order to avoid future environmental and health problems, many of these landfills will soon require expensive remediation measures. This situation might appear bleak, but it does present us with an exciting opportunity for a combined resource-recovery and remediation strategy, which will drastically reduce future remediation costs, reclaim valuable land, while at the same time unlocking valuable resources. However, the widespread adoption of Enhanced Landfill Mining (ELFM) in the EU, as envisaged by NEW-MINE, urgently requires skilled scientists, engineers, economists and policy makers who can develop cost-effective, environmentally friendly ELFM practices and regulatory frameworks. All this demands a European commitment to concerted, inter- and transdisciplinary research and innovation. NEW-MINE trains 15 early-stage researchers (ESRs) in all aspects of landfill mining, in terms of both technological innovation and multi-criteria assessments. The technological innovation follows a value-chain approach, from advanced landfill exploration, mechanical processing, plasma/solar/hybrid thermochemical conversion and upcycling, while the multi-criteria assessment methods allow to compare combined resource-recovery/remediation ELFM methods with the "Do-Nothing", "Classic remediation" and "Classic landfill mining with (co-) incineration" scenarios. By training the ESRs in scientific, technical and soft skills, they become highly sought-after scientists and engineers for the rapidly emerging landfill-mining and broader raw-materials industries of Europe.



EURELCO is an open, quadruple helix network that supports the required technological, legal, social, economic, environmental and organizational innovation with respect to Enhanced Landfill Mining within the context of a transition to a resource efficient, circular, low-carbon economy. Are you a relevant actor working on ELFM? More information on how to become a EURELCO Member can be found here: https://eurelco.org/become-a-partner/

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