



EU TRAINING NETWORK FOR RESOURCE RECOVERY THROUGH ENHANCED LANDFILL MINING

European Training Network for Resource Recovery Through Enhanced Landfill Mining (NEW-MINE)

D6.8 Policy Brief/Newsletter 2



EU Training Network for Resource Recovery Through Enhanced Landfill Mining



Newsletter



The NEW-MINE Newsletter is integrated in the Newsletter of the EURELCO Mother Network, which provides monthly updates on general EURELCO evolutions and on the specific EURELCO-based projects (NEW-MINE, COCOON etc.).

This Newsletter also provides regular Enhanced Landfill Mining Policy Brief sections, where the policy aspects of ELM are investigated and where suggestions to Policy Makers are provided.

The EURELCO Newsletters can be downloaded through: <https://www.eurelco.org/newsletter>

You can register for this EURELCO-NEW-MINE Newsletter [here](#).

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Public

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D6.8 - Policy Brief/Newsletter 2

As stated in the Annex 1 and the NEW-MINE project communication strategy, periodic newsletters are sent as part of the overarching EURELCO-network. In this way, the impact of the dissemination on the medium-long term is ensured and contacts with new potential stakeholders are maintained. Generally, the newsletters are sent every 3 to 4 months; special editions can feature important announcements, news or events.

The newsletters contain:

- Various **news** items, including updates of the most relevant news in the field of ELFM;
- **Policy brief sections**, containing targeted information for policy makers (e.g. ERECON report);
- Information on related **projects** like NEW-MINE; and
- Brief **announcements** and upcoming **events**.

A master database is developed to keep track that each newsletter is addressed to the right audience. By February 2018, over 900 persons and institutions receive the EURELCO newsletters. All newsletters can be found online: new-mine.eu/communications/newsletter/ (and/or www.eurelco.org/newsletter/).

Below, an overview is given of the table of content per newsletter of all newsletters published in the first year of the NEW-MINE project (September 2017 till March 2018). A special issue with the NEW-MINE Policy Brief was published shortly after the fourth symposium on Enhanced Landfill Mining.

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Newsletter #18 (September 2017)

ELFM IV SYMPOSIUM

Register for the 4th Enhanced Landfill Mining Symposium on 5 and 6 February, 2018, in Belgium: Enhanced Landfill Mining & the circular economy (ELFM IV)

Newsletter #19 (November 2017)

EURELCO wins Interreg Europe project COCOON on landfill management

1. EURELCO: early bird registration for ELFM IV
 - 1.1 NEW-MINE: ELFM featured in the UK press
 - 1.2 COCOON: call for best practices
 - 1.3 RAWFILL: recover resources
2. Publication in the spotlight
3. Workshop landfill mining/management

Newsletter #20 (January 2018)

Last call for the ELFM IV Symposium in Belgium

- Setting the scene for the ELFM IV Symposium
- Recent progress on Enhanced Landfill Mining
- Final Symposium Programme

Policy Brief NEWMINE (March 2018)

ELFM IV, February 2018: Six lessons learned



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EURELCO Newsletter #18 - September 2017

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ELFM IV SYMPOSIUM

Mechelen (Belgium)

February 5 - 6, 2018



Register for the 4th Enhanced Landfill Mining Symposium on 5 and 6 February, 2018, in Belgium: Enhanced Landfill Mining & the circular economy (ELFM IV)

It probably seems unthinkable for you but Europe has at least **500,000 landfills full of waste**. Left unattended these landfills may eventually cause all kind of health and environmental issues. Doing nothing is no longer an option. As highlighted by our President in a feature article on the [World Economic Forum website](#), the time has come to **develop a more visionary strategy for Europe's landfills**. Why not transform the "landfill problem" into a "resource recovery opportunity"? Using Enhanced Landfill Mining (ELFM) a good deal of these 500,000 landfills can provide **ample resources in the future, varying from plastics, metals, aggregates, glass and many other products**. As such ELFM is part of the transition to a low-carbon, circular, resilient economy.

Recycling 50% of landfilled household waste is possible but we aim for 100%

Household waste landfills are full of things which can be recycled, provided the technologies are there to do so. With presently available technologies it is possible to recycle already at least 50% of the landfilled household waste. But with EURELCO we go one step further. We aim for near 100% recycling. Today, industrial incinerators can turn

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excavated waste from landfills into all kinds of energy like electricity or, even better, biohydrogen or biomethane, **which can drive the cleantech mobility of the future**. Other fractions of the waste can be transformed into planet-friendly building products such as plasmarock, which can be used for roof tiles, cement, bricks, etc. That's the way to go for scientists and engineers.

Industrial landfills harbour base and critical metals

Apart from household landfill sites, a significant part of the 500,000+ landfills in Europe are so-called "mono-landfills". These are landfills which typically contain just one type of industrial waste. This can be extractive waste from the mining industry or different types of industrial residues from the metal-processing or energy sector. In many cases, these landfills contain vast amounts of base metals (like iron, copper, zinc) and critical metals, which are vital for **the future of the EU economy**. EURELCO targets the **development of metal-recovery technologies**, which simultaneously allow to reclaim the metals, while leaving behind clean mineral residue fractions that can be **converted into low-carbon building materials**. These can range from green cements to inorganic polymers and artificial aggregates. All these products are required for the buildings of the future.

Register before December 1, 2017 for ELFM IV (5 & 6 February, 2017) and receive a discount

During this symposium, the **keynote speakers** will shed light on the recent progress of landfill mining within the wider circular economy context. Apart from shorter oral presentations, the Symposium features a number of selected keynote lectures from top speakers from both **industry (e.g. Renewi, Advanced Plasma Power, Witteveen Bos, Go4Circle, Colruyt, DEME, Group Machiels)**, **research centres (e.g. ETH Zürich, KTH Stockholm, RWTH Aachen, Padua University etc.)** and **public bodies (incl. OVAM)**. Collectively, the lectures cover the full value chain for ELFM for both household waste landfills and metal-containing industrial mono-landfills. Unique summary lectures on advanced sorting, solar/plasma gasification, waste-to-binder and metallurgical recovery technologies will be provided. Social, legal and environmental aspects will take centre stage as well, while the closing debate will discuss the barriers and opportunities for ELFM in the 21st Century.

Check out the full programme and register now!

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1. EURELCO: early bird registration for ELFM IV
 - 1.1 NEW-MINE: ELFM featured in the UK press
 - 1.2 COCOON: call for best practices
 - 1.3. RAWFILL: recover resources
2. Publication in the spotlight
3. Workshop landfill mining/management

1. EURELCO: REGISTER BEFORE 01/12/2017 FOR THE EARLY BIRD DISCOUNT

Over the past few years Enhanced Landfill Mining (ELFM) has gained considerable momentum, as corroborated by the initiation of three EU-funded ELFM-related projects (ETN NEW-MINE, Interreg RAWFILL and COCOON), the rise of EURELCO, widespread press attention and the recent endorsement of the ELFM concept in the "waste package", which was formally approved by the European Parliament on March 14, 2017. The justification for this paradigm change is that ELFM does not only enable the recovery of valuable materials which can be brought back into the cycle, but also allows for recovering land area, taking into account that a large part of the EU's 500.000 historic landfills are situated in a (semi-) urban environment. Nevertheless, the first, full-scale industrial, resource-recovery driven ELFM project still hasn't occurred yet in Europe. Multiple barriers seem to persist, varying from social acceptance issues to delays in permits. ELFM IV thus faces both challenges and opportunities.

This ELFM paradox will be central to the 4th ELFM Symposium, which takes place in Mechelen, Belgium, on 5 and 6 February 2018. [Check the programme](#). In the closing

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The early bird registration deadline for this unique Symposium is approaching fast: December, 1, 2017. [Register here.](#)

1.1 NEW-MINE: ENHANCED LANDFILL MINING FEATURED IN THE UK PRESS



Peter Tom Jones and Piet Wostyn, respectively coordinator and project manager of the NEW-MINE project, were contacted to comment on the **latest technological developments** in landfill mining in the magazine “**Engineering & Technology**”. The technology is ready and in some cases there is a valid business case. [Read the whole article >](#)

1.2 COCOON: CALL FOR BEST PRACTICES ON LANDFILL MANAGEMENT

The partners of COCOON are finalising the **report on mapping** and started to develop a **handbook on best practices** about landfill management such as landfill management projects or examples, landfill policy and funding for landfill management projects. Do you have best practices on these topics?

[Contact one of the partners >](#)



1.3 RAWFILL: RECOVER RESOURCES, SMARTLY AND EFFICIENTLY

Valuable resources such as raw materials and energy carriers lie dormant in **North-West Europe's 100.000 landfills.**

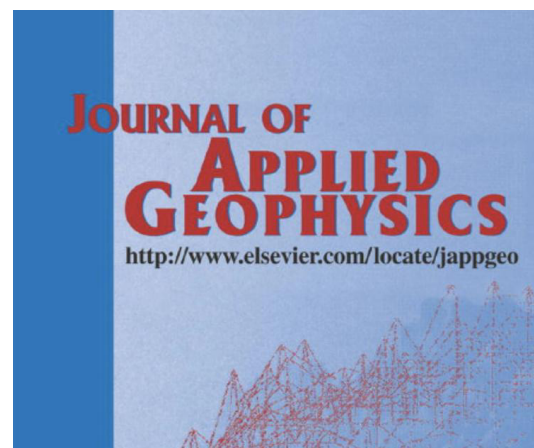
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collaborating partners, **provides support to landfill owners and managers** to recover resources, both smartly and efficiently. [Check the flyer >](#)

2. PUBLICATION IN THE SPOTLIGHT

Gaël Dumont of the University Liege has tested the **ability of geophysical methods** to characterize a large technical landfill installed in a former sand quarry. The geophysical surveys specifically aimed at delimitating the deposit site horizontal extension and at characterizing the waste material composition.

[Read the publication >](#)



3. JOINT WORKSHOP SMART GROUND, COCOON AND RAWFILL ON 7TH FEBRUARY 2018



This joint workshop will provide an overview on initiatives and progress made to date on three EU landfill mining/management funded projects (SMART GROUND, RAWFILL and COCOON) along with **tools to assess the suitability and feasibility of landfill mining, recovery methods and approaches** with the key technical, environmental and economic considerations explored. The discussion will also take place on the issues surrounding

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communities - as well as the future of regulatory frameworks to address these concerns.

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LAST CALL TO REGISTER

ELFM IV SYMPOSIUM

February 5 - 6, 2018



Last call for the ELFM IV Symposium in Belgium

Setting the scene for the ELFM IV Symposium

Over the past few years Enhanced Landfill Mining (ELFM) has gained considerable momentum. Firstly, three large-scale, multi-partner ELFM-related projects have received EU funding. Secondly, the ELFM concept has enjoyed widespread press attention, incl. multiple documentaries and featured articles, such as the January 8, 2018, Special Report in the "50 Ideas to Change the World" Series in the Financial Times. Thirdly, on March 14, 2017, the European Parliament formally endorsed the ELFM concept.

Nevertheless, despite the evolutions and the many **research breakthroughs**, we are still waiting for the first, full-scale industrial, resource-recovery-driven ELFM project to take place. Multiple barriers seem to persist. Legislation for ELFM on the EU and national level has not yet come to terms with the dynamics of the – disruptive – ELFM concept, which is corroborated by the fact the ELFM Amendment of the European Parliament was blocked out in the 2017 Trilateral meeting between the European Parliament, the European Commission and the European Council. Concurrently, market barriers for ELFM remain: ELFM-derived products need to compete with primary resources and several industries are

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intriguing context for the Fourth International Symposium on Enhanced Landfill Mining (ELFM IV).

Recent progress on Enhanced Landfill Mining

Building upon the three previous editions (2010 (Belgium), 2013 (Belgium) and 2016 (Portugal)), ELFM IV provides the floor to a host of both Invited Speakers and Regular Speakers to shed light on the recent progress in both the technological and non-technological aspects of ELFM within the wider circular economy context. Several Invited Speakers provide review/position papers on the status of key ELFM domains, such as

- geophysical methods for landfill exploration
- state-of-the-art sorting technologies
- solar and plasma gasification
- multi-criteria assessment results of ELFM projects

As such you receive a comprehensive overview of the wide ELFM research and innovation domain. The wide diversity of participants reflects the multi-actor, “quadruple helix” approach that is endorsed by EURELCO, the European Enhanced Landfill Mining Consortium. Such an approach is essential to obtain and maintain the “Social License to Operate”, in which ELFM is fully integrated in a wider, system-level transition to a low-carbon, circular economy.

Final Symposium Programme

The [Final Symposium Programme](#) has been released.

Last chance to participate. Register before 24th January.

Kind regards,

Peter Tom Jones, for the ELFM IV [Organising Committee](#)



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Photo, N. Herbots

ELFM IV, February 2018: Six lessons learned

On 5 and 6 February 2018 the *4th International Enhanced Landfill Mining (ELFM IV) Symposium* took place in Mechelen, Belgium. The event was a success: more than 150 attendees; diverse, high-quality lectures by both senior and junior ELFM actors; strong interaction with the public; and a very lively closing debate on the future of ELFM in Europe and the rest of the world, with contributions from industry, the European Commission, national policy makers, the International Solid Waste Association and research organisations. The present Policy Brief, authored by Dr. Peter Tom Jones*, reflects upon the key discussions that took place and discusses “Six Lessons Learned” with respect to the future of Enhanced Landfill Mining.

Executive Summary, the 6 lessons learned:

- **Lesson 1:** Enhanced Landfill Mining is grabbing a lot of attention, with three EU-funded projects underway. In addition, it provides the dual benefit of recovering valuable materials and freeing-up useful space in areas close to towns and cities.
- **Lesson 2:** What stands in the way of large-scale ELFM? The main obstacles are market & technology barriers, legislative procedures and problems with social acceptance.
- **Lesson 3:** ELFM is an emerging concept and relies upon novel technologies. Without support, it may never be able to take over from the incumbents. Society needs to be made fully aware of the situation, so that long-term solutions based on the best available information can be adopted.
- **Lesson 4:** Financial considerations are holding back ELFM. Being able to reclaim land at the same time as reclaiming materials represents the best way to shift the economic balance. Another possibility is to target landfills in the developing world, as these are often devoid of sanitary technologies.
- **Lesson 5:** ELFM is still a long way from being accepted by national policy makers. Unfortunately, the rejection of the European Parliament’s ELFM Amendment by the European Council means it will be some years before the idea of landfills being “dynamic resource stocks”, rather than “end stations” for obsolete waste, can be put on the agenda again.
- **Lesson 6:** Social acceptance is a major barrier for ELFM. The solution is to educate and involve people, demonstrate the advantages and let them see the benefits.



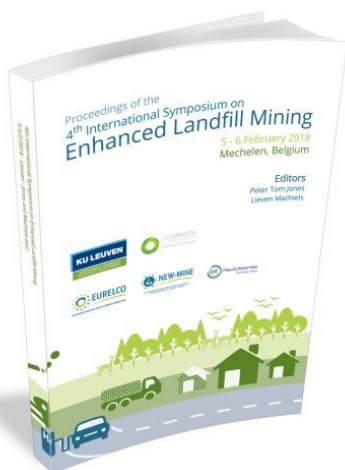
Key videos & documents from ELFM IV, February 2018



ELFM IV testimonial video, which integrates a large number of testimonials and diverse perspectives from the European Commission, academia, industry and civil society: [view here](#)

ELFM IV closing debate video

From left to right: Victor Dries (moderator, Policy Advisor Flemish Government), Magnus Gislev (EC DG GROW), Derek Greedy (ISWA), Yves Tielemans (Group Machiels), Claudia Neculau (SpaQue, Interreg NEW RAW-FILL), Jan Frank Mars (RWS, Interreg Europe COCOON) and Mieke Quaghebeur (VITO): [view here](#)



ELFM IV Symposium Book (eds. Jones & Machiels): [download here](#)



All ELFM IV Presentations and > **100 photographs** (by Nicolas Herbots) can be [downloaded](#) through the [ELFM IV event page](#).

1. The rise of ELFM

Over the past few years Enhanced Landfill Mining (ELFM) has gained considerable momentum, as evidenced by the start of three EU-funded ELFM-related projects (ETN NEW-MINE, Interreg RAWFILL and CO-COON), the rise of EURELCO, widespread press attention (cf. Financial Times, World Economic Forum) and the recent endorsement of the ELFM concept in the “Waste Package”, which was formally approved by the European Parliament on 14 March 2017.

The justification for this paradigm change is that ELFM not only enables the recovery of valuable materials that can be brought back into the use cycle, but also recovers areas of land, with a large part of the EU’s 500,000 historic landfills situated in a (semi-)urban environment.

2. First full-scale ELFM project yet to arrive

ELFM IV gave a lot of attention to the fact that the first, full-scale industrial, resource-recovery-driven ELFM project still hasn’t occurred yet in Europe. As presented during the opening session, three key barriers needed to be discussed: these range from (1) market & technology barriers to (2) legislative procedures and (3) social acceptance issues. These are discussed here.

3. ELFM & concept, market and technology-readiness levels

Enhanced landfill mining (ELFM), which aims to go beyond classic “quick-and-dirty” landfill mining (LFM), remains an emerging concept and relies upon novel technologies that still have relatively low Technology-Readiness Levels (TRLs). Both the concept and the technologies, as well as the related products, need to compete with more established, mature concepts and technologies. Straightforward landfill operation (driven by gate fees) is a less risky business than performing resource-recovery-driven ELFM (without gate fees). Likewise, the traditional incineration of waste (or in the case of classic LFM: RDF developed from excavated waste) is a mature technology with strong vested interests. Furthermore, large, centralised incinerators thrive on gate fees to make the process economic. Decentralised, smaller plasma-gasification units could provide a valuable alternative but still need to scale up and convince investors that the risk is worth taking.

Rolf Stein (CEO of Advanced Plasma Power) provided a clear example of how plasma gasification can scale up in an intelligent way, i.e., learning from the mistakes that were made in other plasma-gasification projects. The presented plans for the first industrial-scale plasma-gasification unit with syngas



Rolf Stein (Advanced Plasma Power) at ELFM IV, Photo: N. Herbots

Europe’s half a million landfill sites potentially worth a fortune

Waste can now be mined for metals and to create fuel



Photo, Financial Times



APP's Bio-SNG demonstration plant in Swindon, UK

conversion to bio-SNG provided a clear way forward. With respect to the targeted high-added-value products generated in ELFM operations, a similar remark is valid. Take the example of inorganic polymer (IP)-based construction materials derived from plasmarock, which in itself is an output of plasma-gasification units. These IP-based products need to compete with traditional OPC-based products. Once again, this is a mature industry with a proven product and sound economics. IPs represent David, while OPC cement plays the role of Goliath. Nevertheless, considering the massive climate footprint of the cement industry, IPs from ELFM and other operations offer a green way forward. However, without clear policy support (e.g., measures to stimulate the market uptake of secondary raw materials) the partial substitution of cement by IPs will happen too slowly. This clearly shows that society needs to decide about which path should be followed in the future. Researchers and technology providers cannot provide the silver-bullet solution here.

4. More attention needed for land reclamation and closing dumpsites

ELFM IV confirmed that the overall economics of ELFM operations are still relatively poor, explaining why large waste-management players remain reluctant to fully invest in ELFM. Only when land reclamation can provide substantial additional revenues will the economics of ELFM become positive in the present policy-support and market context. Throughout ELFM IV, the primary importance of land reclamation, when performing ELFM projects, was corroborated by multiple stakeholders.

In this context, **Derek Greedy (ISWA)** referred to ISWA's campaign to close the world's 50 biggest dumpsites and to remediate them, providing a safe environment for housing in cities with burgeoning populations. In fact, Derek Greedy believed that it would be wise to start performing ELFM projects in the developing world, rather than in the Western world, where most landfills are either sanitary landfills or at least offer some kind of environmental protection technologies. On the other hand, he also immediately acknowledged that a lack of funds in the countries where large dumpsites prevail will represent a massive barrier to ELFM taking place there.

5. Legislative barriers remain

During the closing ELFM debate a lot of attention went to the legislative situation in Europe. The fact that the ELFM Amendment that was agreed by the European Parliament in 2017 ("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.") was later blocked by the European Council during the trilateral meeting between the European Parliament, the European Commission and the European Council, highlights that there is still a long way to go before ELFM is accepted as the new standard by national policy makers.

Magnus Gislev (European Commission) confirmed that this rejection by the European Council means that the



On the left, Magnus Gislev (EC) speaking during the closing ELFM IV debate; in the middle, Derek Greedy (ISWA); and on the right, Yves Tielemans (Group Machiels), Photo: N. Herbots



ISWA's campaign to close the world's biggest dumpsites, Photo, ISWA

window of opportunity for modifying the EU Landfill Directive framework will now be closed for several years. “The train has left”, said Magnus Gislev. This represents a major delay for getting ELFM implemented at the EU-level. In reality this implies that Europe basically still considers landfills as “end stations” for obsolete waste, rather than as “dynamic resource stocks” that can be re-injected into the economy when the time and the economics are right. The importance of the required paradigm shift with respect to the definition of a “landfill” – from a static (linear) view towards a dynamic (circular) perspective – will need to be put on the agenda again in the coming years.

Associations like EURELCO and vanguard policy makers like OVAM or RWS will need to highlight that the proposed ELFM Amendment to the Landfill Directive should not be seen as an obligation, coming at a large cost, but rather as a massive opportunity, which, in the long run, will save costs (landfill closure and/or clean-up costs, raw-material costs, etc.). Again, this reflects a societal choice as the environmental and social benefits with respect to cleaning up the historic legacy of EU-landfills should be made much more explicit, as also acknowledged by Derek Greedy in the closing debate.

6. Social acceptance issues

Finally, ELFM IV also strongly reflected on the issue of social acceptance, which can represent a massive barrier for the implementation of any specific ELFM project. The mayor of Houthalen-Helchteren (i.e., the city where the benchmark ELFM Closing-the-Circle project of Group Machiels (Remo landfill site) is set to take place) provided an inspiring speech during the opening session of the second day. Alain Yzermans stated: “... fear of change and innovation is a poor adviser for shaping the future. Sometimes I think that NIMBY [Not In My Back Yard, ed. ptj] has become even more robust and harder. It seems to have become almost the “not-in-my-whole-life-syndrome”... It is a relatively populist feeling that is dif-

ficult to confront with arguments. Some of the local people say: let the 17 million tonnes of waste [in the Remo landfill site, ptj] rest under the ground forever. There the waste will be “healthy and safe”. Isn’t that ironic? Of course, each project must meet the highest safety and health standards, especially for local residents, but it must not be a reason to block a project with so many intrinsic values.”

The whole of the ELFM IV audience acknowledged the importance of this “Social License to Operate issue”. Therefore, a pro-active, multi-actor approach, which involves all the stakeholders of a local ELFM project, is absolutely essential for the successful implementation of any given ELFM project. In this context it was heart warming that 8 so-called “locals” of the Remo landfill site were also present at the ELFM IV Symposium and provided their own keynote presentation. During the debate it was acknowledged that all future national and EU projects on ELFM (and primary mining) should by definition integrate “citizen science” and civil-society engagement aspects, so that local communities are genuinely involved, from the first day onwards of an ELFM endeavour. This will be the only way to overcome the NIMBY syndrome and to obtain and maintain the Social License to Operate for ELFM in the future.

Let’s hope that by ELFM V we will be one step closer to the first full-scale realisation of a resource-recovery-driven ELFM project.

Want to react? Send your comments to peter.jones@kuleuven.be.



Mayor of Houthalen makes inspiring speech at ELFM IV, Photo: N. Herbots

*Bio: Peter Tom Jones

Dr. 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](http://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 author of numerous papers and books in the field of transition management, climate change policies, recycling, metallurgy and Urban/Landfill mining. In March 2014 he was elected to become the General Coordinator for the European Enhanced Landfill Mining Consortium (EURELCO). Jones also coordinates the EU H2020 MSCA-ETN NEW-MINE project on ELFM.



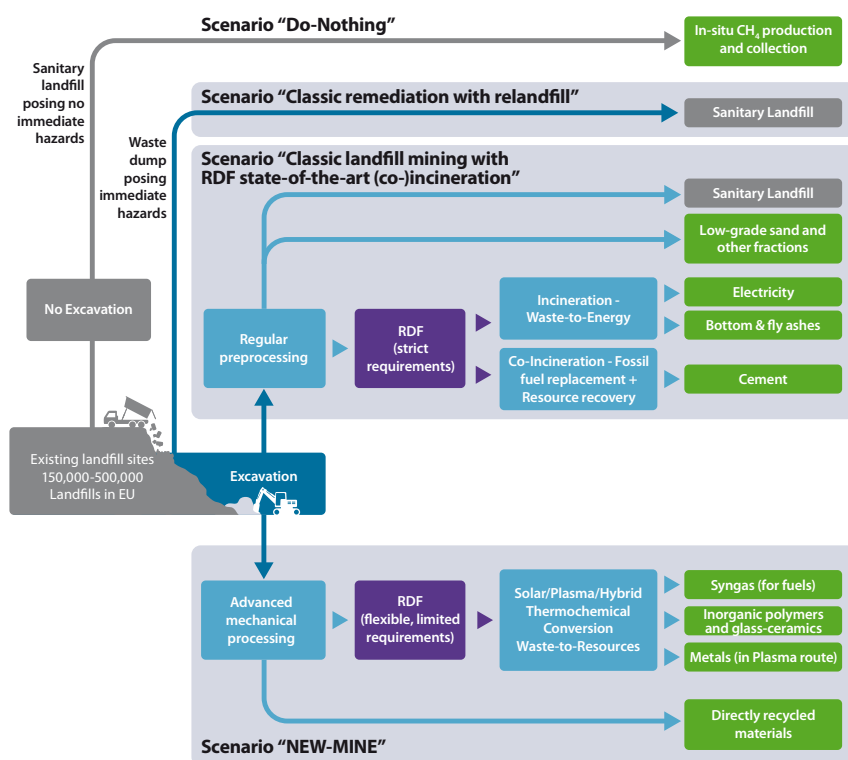
EU TRAINING NETWORK FOR RESOURCE RECOVERY THROUGH ENHANCED LANDFILL MINING

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 with 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 techno-

logical 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.



* **Disclaimer:** the views expressed in this article are the private views of the author and may not, under any circumstances, be interpreted as stating an official position of ETN NEW-MINE, EURELCO or SIM² KU Leuven.