

COCOON LEF session

Interim Landfill Use

“Consortium for a Coherent European Landfill Management Strategy”

Date: June 5, 2018



SUBJECT: LEF session interim landfill management RWS the Netherlands

☒ report ☐ information ☐ consideration ☐ decision

To: public

From: RWS Leefomgeving

COCOON: Consortium for a Coherent European Landfill Management Strategy

COCOON is the first European project on policy of Landfill Management (LfM). The COCOON partners will improve regional policy on LfM in 6 regions, starting from existing regional legislation, and learn from the best practices and lessons learned in the other regions. Working with a regional stakeholder group on the development of the policy will enhance the implementation of the policy.

Objective of this COCOON session

Europe has more than 500.000 landfills! Are these locations with their potential environmental risk putting a lock on area development?

Or are these landfills possible stocks which contain resources for future generations?

On the 5th of June COCOON partners and stakeholders joined together in the Netherlands, to explore opportunities for interim landfill use. Since the 1950s Europe has been disposing vast levels of waste in landfills. Estimates have revealed that over 90% of Europe's 500,000+ landfills are "non-sanitary" landfills, which predate the EU Landfill Directive and have limited environmental protection technologies.

Mr. Peter Frijns, Project Manager Landfills at Ministry of Infrastructure and Water management stated in his introduction that the policy fields; circular economics, sustainable land use and landfill management can reinforce each other and contribute to interim landfill use.

During in-depth sessions, all ideas and opportunities were discussed and collected. Concluded was that there are plenty of opportunities for the themes: temporary storage, sustainable area development, mining for residential developments and accumulation of future values to contribute to a circular economy and sustainable area management. COCOON partners will take up the gauntlet and implement these ideas in their regional action plans.



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Introduction

Europe has more than 500.000 landfills! Are these locations with their potential environmental risk putting a lock on area development?
Or are these landfills possible stocks which contain resources for future generations?

On the 5th of June COCOON partners and stakeholders joined together in the Netherlands, to explore opportunities for interim landfill use. Since the 1950's Europe has been disposing vast levels of waste in landfills. Estimates have revealed that over 90% of Europe's 500,000+ landfills are "non-sanitary" landfills, which predate the EU Landfill Directive and have limited environmental protection technologies.

The European commission has acknowledged that a vision for managing Europe's landfills is urgently required. Landfills are to be considered as dynamic stocks of resources (landfill gas, water, other) which can be integrated into the economy, while landfill management (LfM) supports reclaiming land and avoids astronomic remediation and aftercare costs. Although many EU regions are already implementing LfM, no targeted, specific European LfM legislation currently exists. Nor are existing Waste Management and Soil Protection policies integrated in an overarching circular economy framework.

The day was opened by Mr. Peter Frijns, Project Manager Landfills at Ministry of Infrastructure and Water management. He stated the importance of European cooperation and coordination on landfill management especially. The policy on landfill management in the Netherlands is based on risk reduction, for the short and long term. This aftercare for closed landfills is managed by the regional authority and not by the landfill owner. We can ask ourselves if this is a good solution for next generations. Are landfills stokes of resources? Should our future policy in landfills change towards circular economics and sustainable land use? This day is devoted to answering this question: *"How can policy fields reinforce each other and contribute to interim landfill use?"*

At the end of the day all ideas were collected on how to share knowledge and policy renewal for more sustainable landfill management.



Round table conversation

Marjolijn de Graaf, the moderator of the day, introduces the round table members.

- ✓ **Peter Frijns**, project manager Landfills at the Ministry of Infrastructure and Water Management. At this Ministry he is also involved in the current review of the European Waste Shipment Regulation and in industrial innovations that contribute to the transition to a circular economy;
- ✓ **Marja Jochemsen**, project manager Landfills, Waste and Drugs policy at the province Noord-Brabant. Related to landfills the team works on both: non-sanitary and sanitary (open and closed) landfills;
- ✓ **Margot de Cleen**, Ministry of Infrastructure and Water Management as senior consultant Soil and Water. Margot works on the Dutch Knowledge Agenda on soil and subsurface and she is member of the Expert group Soils of the European Commission "Soil as a resource";
- ✓ **Bon Uijting**, Currently working at Rijkswaterstaat as a consultant circular economy with a focus on materials (scarcity, circular processes, data-systems). In the early 1990's Bon was responsible for the development and introduction of a new data-based risk assessment model for landfills in the Netherlands which was then applied on 900 non-sanitary landfills in Noord-Brabant.

Marjolijn asks: "What is your dream for (interim) landfill management?"

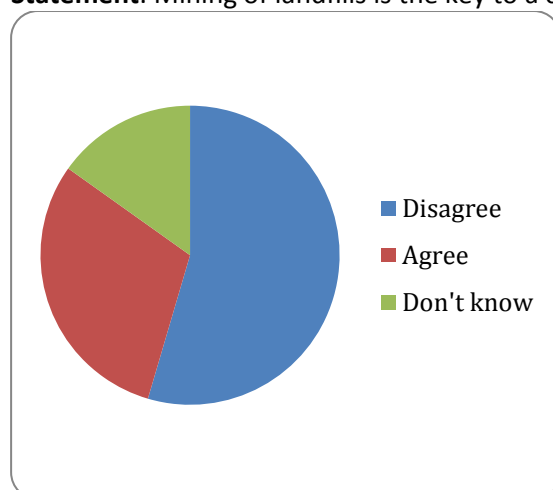
Peter: landfills are part of a sustainable and circular economy. We do not leave any environmental problems for future generations. Instead, we provide possibilities for future use of materials.

Marja: Landfills are not a risk for the environment. They are part of the Noord-Brabant landscape. Both landfills and landfill policy contribute to a circular economy.

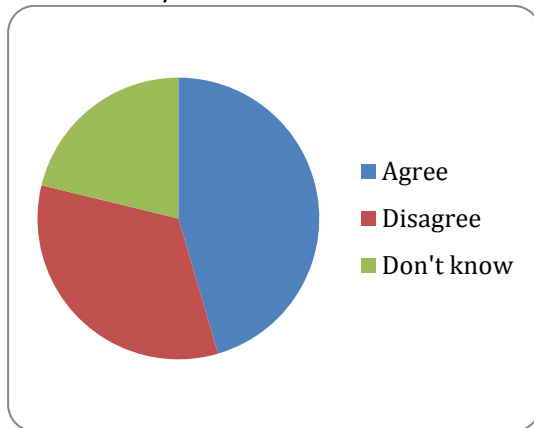
Margot: Happily I am not dreaming of landfills or landfill management. Would I have a dream, then it would be: no more landfills!

Bon: Making valuable materials in landfills available again and to use them from now on circular!

Statement: Mining of landfills is the key to a circular economy and sustainable area development



Statement: Temporary use of landfills is already possible. Policy changes are not necessary



Marjolijn asks: "Why isn't your dream a reality yet?"

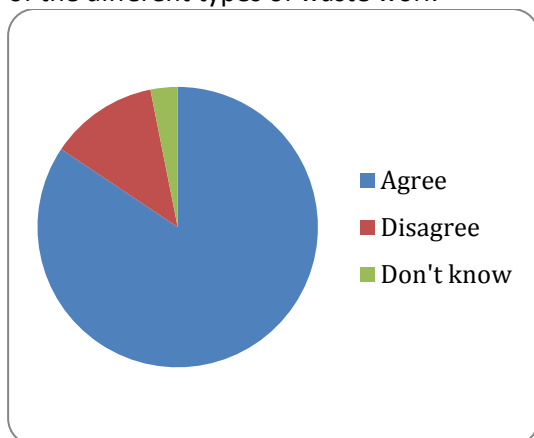
Peter: Determining which materials can be mixed and which materials must be kept separated in order to maximize the potential for future mining of a landfill, and contributing to a circular economy;

Marja: Legislation needs to be adapted and regional authorities also need budgets to realize these ideas. We can ask ourselves if it is wise to spent millions of euros on capping if we remove them in a couple of years time. Cooperation between authority and owners requires guts and trust.

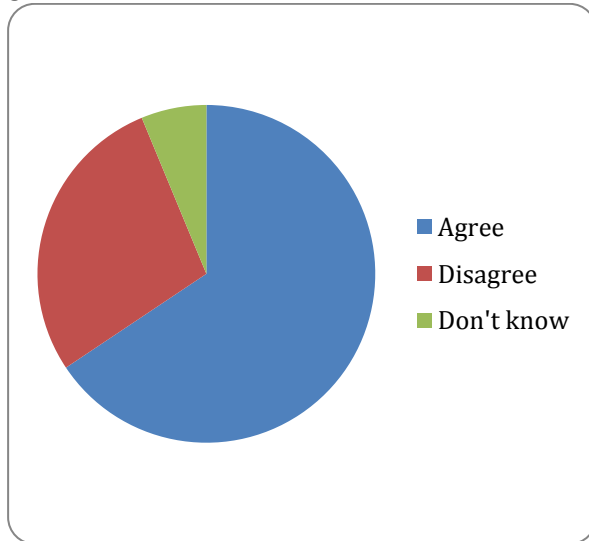
Margo: To achieve such a dream a strong preventive policy is needed to prevent waste and to prevent waste to be landfilled. Thus covenants with producers or other policy measures to produce circular products and measures to prohibit landfilling and find other ways to treat waste are needed. Good examples of temporary use, new business models and for example instruments like Green Deals or covenants are essential to show how this temporary use can be put to action.

Bon: Awareness for public and authorities of how much valuable and sometimes now scarce materials are present in landfills in the EU. Therefore a need for development of technology for the extraction and recycling of these materials is needed. With projects such as COCOON this awareness can be achieved.

Statement: Regulation and innovations are necessarily to make temporarily storage and separation of the different types of waste work



Statement: It takes guts, courage and daring to cooperate between government and business life to tackle landfill management challenges.



Marjolijn asks: “How can policy fields reinforce each other?” Enlighten the audience with your provoking consideration!

Peter: Is landfill mining a realistic option? There is still a mindset it is too expensive and not realistic. This mindset has to be changed!

Marja: Are we prepared for far-reaching measures in the field of legislation and regulations to allow landfills to be mined in time? That is the question which has to be answered!

Margo: Temporary use of landfills and mining in the end has to be added to the EU goal for resource efficiency in a lot of different ways. Landfills are old school. No more landfilling unless it contributes to a circular economy.

Bon: The real challenges of landfill mining requires intensive international cooperation on assessment (where, what) and technology (how). Exchange of knowledge and experiences, development of pilots and scale-up projects and financing: that is what is needed on the short run.

Workshop sessions

Workshop long term storage

Martin L'Annee de Betrancourt, SNB and Heijo Scharff, AFVALZORG

Humans, as well as animals and plants, need phosphate in order to live. There is no substitute for phosphate. In Europe there is no natural source of phosphate. Therefore phosphate is a valuable resource and can be recovered from sewage sludge ashes. For that we need mono-incinerators and plants to extract the phosphate from the ashes. At present these ashes are used in concrete and asphalt. This is a real waste of a natural resource.



To enable the use of secondary resources for which currently no recycling option is available, but is expected within the next decade (or so).

Does EU legislation allow storage longer than 3 years under landfill conditions? Regulation barriers seem to be national and can be dealt with nationally. In the German “Deponieverordnung” long term storage is possible.

There is a lot of concern about financial implications. Costs may be obstructive. In many cases it is obviously a lot cheaper to simply landfill. That can only be prevented if society decides it is unwanted and a landfill ban is imposed.

Open questions that raised:

-What is best practice? There is very little experience and different materials may require different approaches.

-How to prevent that storage becomes everlasting? If currently no financially and/or technically feasible recycling option exists, there is no 100% guarantee that it will come. It may in the end be necessary to find an alternative. That alternative could be landfill.

The very least that should be done is to prevent that costs are averted to society. This is possible with a financial security. Legislation on financial security is in place at EU level and at national level in many member states.

Limited experience shows that long term storage and actual recycling requires that it is exactly known where the material is stored, that is easily accessible and that it can be removed without contamination.

The statement was made that if society is serious about making landfill subject to a circular economy, it should accept the additional costs. But it also requires complete rethinking of landfill technology and operation. Landfills have to be operated as archives. It should be relatively easy to take the materials out without contamination by other materials.

Metaphora: Long term storage of waste and phosphate recovery	Likes	Dislikes
Will temporary storage result in 'everlasting' storage? Risk if no deadline is given	2	0
Is there a model or good practice of temporary storage ?	1	0
What kinds of materials are companies currently storing?	1	0
Is it feasible? Even if the landfill has not been sealed yet?	0	0
What is considered as long term storage and what are the differences with a landfill in exploitation according to EU landfill directive?	0	0
Any other values for long term storage? In water we have a lot of phosphate to mine.	0	0
P2O5 is valuable for life. Don't stop it in asphalt please!	15	0
National legislation requires amendment	10	0
Obvious good idea but financially is the question	10	2
Rethink landfill operation to enable recovery	8	0
Temporary storage needs more attention at politicians.	6	0
Financial deposit for the top cover is already applied for extending the period of storage, but the financial burden is too high..	5	2

Communication to break some barriers	5	0
Landfills should be managed as archives	5	0
Recovering phosphate from sludge needs more attention at politicians to provide that the ash will downcycle more and more	4	0
I heard interesting (German) example	3	0
What to do with the residue of this process. Is this contaminated?	0	0

Workshop: Sustainable area development at 'VAM-BERG'

Erik Kuiper, AFVALZORG

Transformation of a sanitary landfill towards a cycling paradise. The former situation until now: a sanitary landfill exploitation. The owner intended change and ambition. They already started with a public landscape and cycling area. This solution is being applied to improve landfill management.



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An example of good cooperation with the result of a sustainable area development, shared ambitions and values of all stakeholders achieved results or end situation:

The WORLD CHAMPIONSHIP CYCLING IN 2020 AT THE 'VAM-BERG'!

Erik Kuiper explained the situation at the VAM Landfill in the Dutch province of Drenthe. A huge site, already in production for a very long period. At this moment the landfill is mostly used for mineral waste and asbestos; other waste is recycled or incinerated next to the landfill. The landfill forms a "mountain" in the Dutch flat landscape with a height of 50 meters. The challenge is to give this mountain an extra value, while still in operation partly as a landfill and partly as waste treatment centre. This extra value is sought in a recreational function.

The VAM wishes to make this mountain fit as a part of the track of a bicycle race. To realize this goal a business plan is made up with different stakeholders in the environment, such as the Provinces of Groningen en Drenthe, cycling clubs and other recreational organizations and local businesses.

Part of the business plan is the reuse of bottom ashes from the waste incineration to top up the mountain. Discussions took place on whether this way of using the ashes could be considered as reuse or whether it should be considered as landfilling. The latter is not allowed for bottom ashes. The partners agreed that the ashes may be used to top up the mountain for the cycling track and other trails.

In the discussion it turned out that the challenge to make this mountain stand out as a recreational site is big, considering the recreational opportunities already existing in the vicinity of the site. One of the attendees proposed to use the mountain for paragliding.

Metaphora: Sustainable area development: VAM-berg

Likes Dislikes

Will it be a circuit or does it fit into the regional network? (or part of a cycle highway?)	0	0
How to create support for these unusual projects?	0	0
Isn 't this a quite ineffective use? Why not for example use for solar energy?	0	0
To be creative with waste and waste disposals	2	0
Business plan without roof of Drenthe is unclear	2	0
Good idea! It can be used for paragliding too.	1	0
Clever business case	0	1
Financial sound businesscase?	0	0
Who is responsible for the exploitation in the future? Where is the money coming from?	0	0
Linking it to Eurovelo network?	0	0

Workshop: Mining for residential developments

Hans Geusebroek, Sweco

Removal of landfill Benedeneind in Veenendaal, the Netherlands. Two old landfills which were covered with soil for agricultural use. A complete mining project for city development. Removal of 54.000 m³ including mining from 1998 to 2001. 80% of material is reused in the development and 20% brought to a sanitary landfill. The area is now a popular residential site.



Analysis of different aspects:

- ✓ legal and political
- ✓ technical and environmental
- ✓ financial and economical.

This analysis results in a list of possible future options and technical measures needed.

New function of the former landfill can be:

- ✓ Recreational (park, golf course)
- ✓ Agricultural
- ✓ Energy production (solar field)
- ✓ Industrial, commercial
- ✓ Residential (after landfill removal)

Adequate technical measures are needed to lower risks to an acceptable level for the desired future function. Remediation options go from isolate and monitor, to complete removal and re-use of the mined materials.

Metaphora: Mining for residential developments	Likes	Dislikes
Which technical problems came up during excavation phase?	2	0
What kind of waste was deposited in the landfill?	2	0

Which materials were reused? How?	2	0
Remove all the waste? If not, how do you know its safe for housing?	1	0
How well developed is mining technology and knowledge?	1	0
Why not everywhere?	1	0
No complaints from neighbors about odor, transport movements etc?	1	0
What kind of data are essential to redevelop those landfills?	1	0
Sanitary or non sanitary? If not, what about soil contamination? Is the area really "safe"?	1	0
The concrete possibilities that landfill mining can be real and beneficial.	9	0
Examples of good mining projects from NL.	8	1
Food for thought about landfill mining.	8	1
Technically these redevelopments are no problem; financial aspects are crucial.	8	3
Spatial planning required more attention.	7	0
A good review of all the possible solutions prior to choose the best option	6	2
I think that mining is a good idea, but depending of the value of the land could be affordable or not.	6	1
How to handle asbestos. That is the question	6	0
Landfill mining should never be about profit but for the benefits of the environment and humans alike.	5	3
Going to look at the costs and benefits of mining (business case) of a landfill of mine.	5	2
Success depends on creating a smart business case.	5	0
How circular is mining and dumping on another landfill?	4	0
Landfill mining is very interesting. But what about landfills where you have very limited knowledge on the waste? How to assess the dangers?	4	0
Do people want to live on old landfills?	3	0
Mining is a good option to get a successful business case	2	3
Landfills are not only a final disposal site. There is an eternal low valuable land take.	2	4
80% reused? What material was that?	1	0
What was the business case at mining Veenendaal? Was there subsidy from the Government (municipality?)	0	0

Workshop: Accumulation of Future values

Ron Nap, City of Apeldoorn, Jurgen van der Heijden, AT Osborne and Marcel Rozing, AFVALZORG

The challenge of redeveloping 4000 non-sanitary landfills, and the necessity to have a financial instrument to take on this challenge. Provide with knowledge and finance for less risk and more investment in projects that



contribute, because of their multiplicity, to better soil, water, energy and climate.

Combining two or more functions within one comprehensive infrastructure project enables each of the functions to strengthen the other; the project creates two or more benefits, social, ecological and economic. Extra (monetizable) functions will become available to make the project's benefits grow, and share the costs over extra activities, making the project more robust. The shared savings and benefits are distributed in a right way to the partners within the joint venture, in a transparent verifiable manner that increases stakeholder and public confidence. The partners are able to share costs, enable one another to generate benefits, distribute income, invite new partners to create future value, whilst keeping transaction costs low. The shared savings and added revenue sources and value captured create a business case strong enough to pay loan interest to the Fund now and later.

The project varies enough from other projects in the Fund's portfolio so that the Fund can spread risk over a balanced portfolio; and the risk of project failure (e.g. through cost overrun, political risk, delays) is reduced. The project fits with the overarching goals of the Fund, adding to its development as a fund leading the way towards more multiple benefits projects.

The central question and starting point of the workshop was "How to turn your landfill into a business model". Some answers for this question were illustrated by Afvalzorg, a Dutch organization which looks after more than 200 sites. Several keys to success were shown by aid of two show cases. The fact that they take care for several sites makes it possible to create a fund. Contributions to the fund come from the landfill taxes of which a part is put aside for aftercare. This fund makes it possible to create extra value for "dynamic" sites, sites situated thus that extra value for recreation or housing is made possible. They create new income for sites where extra income is not evident and costs are made for aftercare.

So one of the important questions is: how to add value? All kind of functions can be considered. In the discussion it became clear that it is important to involve the environment and society in a broad sense, who/what can benefit of the site and who are possible stakeholders? They can invest in the new (temporary) use of the site. Connecting to for example the Sustainable Development Goals by growing biomass or enhancing pollination by creating a biodiversity stepping stone are examples of adding value but also housing or recreation are strong values.

Funding has important criteria: it should add to societal values, it should be sharing costs, risks should be managed (also investment risks). This means that upscaling helps, but is not a necessity. Showcases are essential!

Metaphora: Accumulation of future values	Likes	Dislikes
How to arise ambitions for values for local government	0	0
What are the experiences with the accumulation for future values of LF sites in the Netherlands?	0	0
How to add nature as a positive value?	0	0
The advantage of reusing the site over and over	2	0
Show cases	2	0
Added value by creating nature by using soil for the closure	0	0
A solution for environmental problem in spatial planning	0	0

What is the balance between cherry picking and less favorable sites. Package deal?	0	0
In Italy other problems have more priority for cities	0	0
Who is the owner of the fund?	0	0

Chatterbox:



A paradigm shift
from final storage
to resource
management

Define temporary....
1 year or 5 years
until technology is
available?

Nice use of
technology
.....

Use of storage
at sustainable
landfills

In Malta 1 year is
possible but as I
said, is this
enough?

What does “niet
lullen maar
poetsen” mean?

In Germany it is
already possible

Working instead
of talking!

That’s a utopian
approach

Follow up

Metaphora: How do we follow up on this event?	Like s	Dislike s
Making a handbook of good practices, please send good examples to Ullrich Stock from Germany or your regional COCOON partner	0	0
Temporary storage, what is the time period: 3 or 5 years, or..... Or what should it be?	0	0
Where can I find the presentations of today?	0	0
Important there are stakeholders in the process. Not only at the regional meetings but also in interregional meetings.	0	0
Interactive website for Cocoon.	0	0

First of all we would like to thank all participants for their active contribution. This LEF session inspired us and filled our batteries to continue.

We do not know if this is interactive enough, but do follow our websites for the latest news. We would like to extent our network. Any ideas are welcome. This report and all presentations will be placed on the following websites.

<https://rwsenvironment.eu/subjects/from-waste-resources/projects/europe-cocoon/>

<https://www.interregeurope.eu/cocoon/>

Wordt vervolgd, Fortsetzung folgt, Συνέχεια, Għandha titkompli, Continuará!!

On behalf of Rijkswaterstaat and all COCOON partners,

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