LIFE12 ENV/FI/000592

UPACMIC LIFE12 ENV/FI/000592
UTILISATION OF BY-PRODUCTS AND ALTERNATIVE CONSTRUCTION MATERIALS IN NEW MINE CONSTRUCTION

REPORT ON THE NETWORKING ACTIVITIES CARRIED OUT DURING UPACMIC PROJECT

Project name	**UPACMIC**
Project no	**151006900-019**
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1. INTRODUCTION

The aim of UPACMIC projects action E2, *Networking with other projects* is to establish a proper level of networking with various LIFE and other EU projects to ensure an efficient knowledge and experience transfer in order to foster its replication in similar contexts. All the LIFE network information was actively disseminated also inside the national and regional networks in Finland. Networking was mainly done nationally with different stakeholders in order to gather knowledge and to promote the project methods.

The LIFE projects have been mapped during the project life for the purpose of sharing knowledge and experience, as well as networking with the UPACMIC project. The material available at the web sites of the projects was examined from the point of view of knowledge and experience sharing with the UPACMIC project. The materials available was also assessed for their applicability in the Finnish conditions. The managers of the selected projects were contacted by email and phone in order to further discuss the possibilities of cooperation and the synergy between the projects. The contact was sustained by email and sending the project newsletter. The mapping activity is reported in section 3.

The project established a UPACMIC network of European stakeholders and target audience (see section 3). The network includes:
- The Ministry of Environment (ME) in Finland
- The Finnish Environment Institute (SYKE)
- The Ministry of employment and the economy (TEM)
- The regional centres of economic development, transport and the environment (ELY-Centre)
- The regional state administrative agency (AVI)
- Municipalities and regional authorities, other legislators
- The mining industry in general, national and international umbrella organizations like national Kaivosteollisuus ry and Euromines (European association of mining industries, metal ores and industrial minerals) and individual mining companies like Agnico-Eagle Finland Oy, Dragon mining Oy, Endomines AB, FQM Kevitsa Mining Oy, Lappland Goldminers Oy, Talvivaara and Sotkamo Silver Oy etc.
- European Commission and legislative authorities
- project beneficiaries and co-financiers
- Material producers, industrial byproduct and waste producers
- local/regional/national contractors, entrepreneurs and constructors
- Universities and other similar institutions interest in the project
- Industrial and municipal networks
- Nature conservation and environmental protection organizations like World Green Building Council

The main project results and lessons learnt have been monitored, evaluated and actively disseminated. Especially the action "D5 Guidelines and technical publications" disseminates information for project stakeholders and target audiences. The documents written in the action are open for all regulators interested in alternative construction material utilization in mine remediation projects. Stakeholders like other mining companies with tailings heaps, are encouraged to launch projects that use the techniques and methods demonstrated in piloting action B1. Active encouragement is needed, because utilization is still in the pioneering stage. Universities are encouraged to verify the positive holistic aspects of utilization of alternative construction products and produce new professionals with open mind towards waste materials. New material producers are encouraged to step forwards with their plans. The experience and the findings of the project was actively disseminated through networking with other EU and EU LIFE projects as well as by participation in various European mining conferences and seminars.

UPACMIC project encourage that the methods tested and verified by the project is disseminated and spread around by the stakeholders. The results are available in projects webpage and has been disseminated during the project. The dissemination included the following tasks: media work, maintaining the website, organization of events, seminars, workshops, brochures, newsletters, project video presentation and technical publications.

2. NETWORKING ACTIONS

2.1 UPACMIC partners

UPACMIC project partners are Ramboll Finland Oy (Ramfi, coordinating beneficiary), Fortum Waste Solutions Oy (Fortum, associated beneficiary) and Skarta Finland Oy (Skarta, associated beneficiary).

Ramfi as a coordinating beneficiary was the main responsible for coordinating the project, organizing the meetings and negotiations with the different stakeholders. Ramfi also actively was in contact with the associated beneficiaries and shared relevant information of project possibilities and in addition, e.g. of suitable seminars and events. Ramfi was the contact link between the project monitors and the Commission when needed. The associated beneficiaries also promoted the project needs whenever it was possible.

As a coordinating beneficiary Ramfi organised steering group meetings. The steering group consists of the contact persons from Ramfi, Skarta and Fortum and, also representatives from Ministry of the Environment and the Centre for Economic Development, Transport and the Environment of Northern Ostrobothnia.

The project beneficiaries are devoted to the goals of the project, and disseminated information in their organizations, got feedback and offered support for the active project implementation team of the UPACMIC project.

2.2 Legislators

Important stakeholders in UPACMIC project include the Ministry of the Environment (ME) and centre for economic development, transport and the environment (ELY-Centre). Ministry of the Environment (ME) is the top organization for regional environmental authorities like regional ELY-Centres. The Ministry of Environment is an important stakeholder and a channel to increase the awareness of the project. Also, the legislative and policy changes are coordinated from the ministry of environment. In addition, the state authorities have wide contact networks of regional and national authorities in the EU which will be of great importance while establishing and maintaining the project network and for the objective of increasing LIFE+ project awereness. ELY-centres are very important stakeholders for the project because of their role as the permitting and environmental authority. ELY-centres are the authorities and monitoring application of environmental permits. The regional state administrative agencies (AVI) give permits. The mining permits were given from the AVI-northern Finland and monitored by ELY-centres. The dam structures in Finland were monitored and supervised by "ELY-Centre - Kainuu". Although

complex on small scale, the authorities form an important stakeholder group. National and regional authorities are well connected in Finland to European Commission and Parliament.

On the European level, the EU Commission is a critical stakeholder. The European commission extractive waste directive of 2006 required member states to draw up an updated list of decommissioned and abandoned extractive waste sites that cause serious damage to the environment, or which could pose a serious threat to human health or the environment in the short to medium term. Abandoned mines are under the responsibility of the State and the authorities. In Finland, abandoned mines has been mapped by ELY Centres KAJAK project and the research of the environmental impact of these mines are ongoing.

The active involvement of these stakeholders includes discussions with permitting authorities. This naturally leads to ideas of legislative developments and improved know how among the local permitters.

2.3 Mining industry

The mining industry in general served a platform to be able to disseminate new ideas to all of the 46 mines in Finland, and more mines that are located in the EU area, for possible ideas of transnational development projects. Mines in EU was contacted through the Euromines (European association of mining industries, metal ores and industrial minerals) organization or the national Kaivosteollisuus Ry. The professional organization in Finland, Kaivosteollisuus Ry, offered national links and connections for dissemination.

Several mines from Finland and Sweden were contacted at the beginning of the project when potential piloting sites were mapped. There were active knowledge exchange with Swedish mining company Boliden, for example about cover structures. There was also active co-operation with Särkiniemi Mine; bottom structure and reactive barrier were initially planned to carry out there. The designs were made, but unfortunately the government did not grand funding for Särkiniemi mine closure and the closure was postponed in the future.

Pyhäsalmi Mine offered a site for field test in 2016. Most of the piloting actions were implemented at Hitura mine in 2017-2021. Both of the mines were being closed during the project. Belvedere Mining hosted Hitura mine site at the beginning of this project and acted also as a beneficiary. Due to company´s bankruptcy in 2015, Belvedere mining withdrew from the project.

The project disseminated the alternative construction possibilities to mining industry in various events and by newsletters during project years (networking timetable as annex 1).

2.4 Material producers

Ramfi has a wide experience utilizing alternative materials in various infrastructure projects and has a good knowledge of material producers in Finland. Co-operation has been carried out also with UUMA 2-4 projects, which has contacted material producers extensively in Finland. Active communicating with the producers and mapping the availability of the materials was essential.

An important aim for UPACMIC project was to link material producers and constructors. Final technical report on the MSCD-model (logistical model for utilisation of by-products in mine remediation) and Material matrix was created to help constructors to evaluate suitable materials in future projects.

2.5 Constructors

Project associated partners, Fortum and Skarta, were constructors in the UPACMIC piloting actions. Both of the companies used also sub-constructors. A network of constructors in this project included approx. 20 constructors and transportation companies. During the pilot implementation all the associated constructors shared information and received important experience using alternative materials in mine construction. These experiences are important references for future projects.
Co-operation with UUMA projects enabled connections with largest construction companies in Finland and the project results were disseminated to this group. This increases awareness among the biggest operators in the field.

2.6 Other companies and institutions

Cooperation and networking were active with various companies and institutions during the project.

Universities offered verification service and environmental protection agencies offered valuable critical feedback for the project. Finnish Environment Institute (SYKE), is a research institute and a center for environmental expertise. SYKE has followed the project progress and participated actively in the discussion concerning project objectives. The University of Oulu (KAIVASU project) was involved in the research of the reactive structure pilot, and they have also studied Hitura mine. Information exchange was active with the University of Oulu. The LCC/LCA analyses made during this project was verified by Aalto University experts, who are specialized on life cycle studies.

Feasib Analytics analyzed samples from reactive structure pilot. Feasib Analytics has a laboratory in Nivala (close to Hitura Mine) that has studied e.g. materials from the Hitura mine. Feasib Analytics will continue to monitor the reactive structures implemented in the UPACMIC project from summer 2022 onwards. Also, HUESKER Synthetic GmbH was involved in reactive structure pilot; Huesker's Tektoseal reactive mat was used in the pilot. The HUESKER Group is one of the world`s leading manufacturers of geosynthetics, agricultural and industrial textiles.

At various events the project objectives have been disseminated and information exchanged with many companies and institutions. At WASCON2018 conference a Swedish company Ecoloop presented their knowledge on the use of green liquor dreg in mining environment and offered their expertise for the project. Information about many projects were exchanged between Ecoloop and UPACMIC. Ecoloop was a partner in EU's research and innovation funding programme HORIZON2020 PAPERCHAIN.

2.7 Other projects

The UPACMIC project mapped the relevant EU projects and localized the contact persons in the early stage of the project duration. The project team was in touch with other teams, and they established a working cooperation network. The list of the projects was updated once a year to allow for the inclusion of the new relevant projects. The network connected 8 different projects in the years 2013-2022. The results of the UPACMIC project have been available in an active way to the network members, and others will benefit from the knowledge generated and lessons learned. In the same way the UPACMIC benefit from the knowledge and experience of those projects concerning both the content and successful management tips.

2.7.1 EU LIFE projects

The project team was in close touch with the OSAMAT LIFE (LIFE+ 09/ENV/000227) project team during the early stages of the project. OSAMAT project´s objective was Management of Environmentally Sound Recycling of Oil Shale Ashes into Road Construction Products and it was active in 2010-2016.

LIFE ABSOILS (LIFE09 ENV/FI/000575) acted as a comparison project in evaluating the UPACMIC projects impact on the environment by carbon footprint calculations. Piloting in the ABSOILS project was about utilisation of surplus soils in different civil engineering actions (2011-2015).

LIFE Capacity Building Project Hungary (LIFE14 CAP/HU/000010) visited the UPACMIC project in October 2016 in Espoo. The UPACMIC project was presented and, also the problems encountered were exchanged. The project results were disseminated to Hungary also. UPACMIC project visited Budapest, Hungary on 10th May 2017 at the invitation of the LIFE Capacity Building Project Hungary for the LIFE "Environment & Resource Efficiency" Training Day. UPACMIC project was invited to share experiences regarding the planning, implementation and participation of LIFE projects and to tell about the practical issues – difficulties, innovations, financial planning process, etc.

LIFE Circwaste (LIFE15 IPE FI 004) projects aims are very close to UPACMIC project. Circwaste is an EU LIFE IP project that promotes efficient use of material flows, waste prevention and resource management concepts. The aim is to implement the National Waste Plan (VALTSU) and to steer Finland towards a circular economy.

In addition to above, several LIFE projects have been mapped, contacted and networking opportunities evaluated. List of mapped LIFE projects are presented as annex 2.

2.7.2 National projects

Reactive barrier design and material testing were carried out in cooperation with the KAIVASU project. In this project, the potential of closure facing mine sites in Northern Ostrobothnia to function as a platform for new possibilities was assessed. KAIVASU acted at Hitura mine and information was exchanged actively with this project. HybArkt -project has piloted reactive barrier structure in Pyhäsalmi mine and pilot experiences was discussed with them.

The final webinar of the UPACMIC project was organised in cooperation with two other mining projects; ERDF and LIFE-funded mining environment projects KAIVASU and LeKaT. LeKaT "Lennokit kaivosvalvonnan tukena"-project (The Drones to Support Mining Control project) develops drone methods primarily to support mining surveillance.

Networking was done also through the national UUMA2/UUMA3/UUMA4 project, that promotes the use of alternative materials in infra construction (www.uusiomaarakentaminen.fi). UUMA contacts and website had also been part of the UPACMIC dissemination. UPACMIC project has been presented in UUMA seminars and information of the project has been placed to UUMA website, for example the mining webinar on 16/03/2022 was promoted via UUMA webpage.

2.8 Networking timetable

The projects action D. contains Communication and Dissemination action, through which a network of stakeholders expanded. UPACMIC participated to 24 events, where the project was presented and disseminated. In addition, the project has been disseminated in various smaller focus group meetings and discussions.

Project newsletter was sent to target audience to inform the project progress. Five newsletters were send during the project years reaching approximately 450 recipients.

The timetable of events and newsletter publications is presented as annex 1.

3. UPACMIC NETWORK

UPACMIC project established a network of stakeholders and target audience.

The network includes:
- The Ministry of Environment (ME) in Finland
- The Finnish Environment Institute (SYKE)
- The Ministry of employment and the economy (TEM)
- The regional centres of economic development, transport and the environment (ELY-Centre)
- The regional state administrative agency (AVI)
- Municipalities and regional authorities, other legislators
- The mining industry in general, national and international umbrella organizations like national Kaivosteollisuus ry and Euromines (European association of mining industries, metal ores and industrial minerals) and individual mining companies like Agnico-Eagle Finland Oy, Dragon mining Oy, Endomines AB, FQM Kevitsa Mining Oy, Lappland Goldminers Oy, Talvivaara and Sotkamo Silver Oy etc.
- European Commission and legislative authorities
- project beneficiaries and co-financiers
- Material producers, industrial byproduct and waste producers
- local/regional/national contractors, entrepreneurs and constructors
- Universities and other similar institutions interest in the project
- Industrial and municipal networks
- Nature conservation and environmental protection organizations like World Green Building Council

The network of stakeholders and target audience is presented as annex 3.

4. AFTER-LIFE NETWORKING PLAN

There is a need for solutions provided by UPACMIC project. Based on the feedback from the target audience, the interest for using alternative materials has grown and results of the project are important for future projects. However, more practical piloting is needed before UPACMIC solutions can become a commonplace method. There are a lot of potential sites for future piloting in Finland. KAJAK project has mapped un-hosted mines in Finland and the project categorized 19 of them to be in need for actions. Pyhäsalmi mine is being closed in 2022 and the results produced by UPACMIC can be used in the closure of tailings ponds. There are also new mine projects where the UPACMIC

solutions can be piloted; Mining company Keliber is setting up new lithium mines at Kokkola. At the same time the Port of Kokkola is being expanded. There are negotiations for utilization of the mining waste materials at the port construction site and this project is applying for EU LIFE funding.

The communication materials and results are used After-Life in the project negotiations and future events. After-Life events has been mapped and will be tracked after the project. UUMA seminars are being organized every year and Kaivosteollisuus ry organizes events frequently. Several international conferences are coming up including the topics of UPACMIC project, for example WASCON 2023.

All the UPACMIC materials are available to audience at projects website and the sites are operated by Ramboll Finland Oy at least until the end of year 2027. The network provided by UPACMIC project is a useful tool for future projects and co-operation will continue with many of the contacts.

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Annex 1

Networking Timetable 2013-2022

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2013								1. press release; Newspaper article in Nivala-lehti; 2. UUMA II conference in Oulu, 13.8.	Kuopio-Mine Water Management and Treatment seminar (24-25.9)		1. UUMA2 seminar in Helsinki (14.11); 2. UUMA2 seminar in Pohjanmaa (24.11)	1. visit at Dragon Mine 5.12.; 2. Amsterdam,Global Forum on Sustanability and Social Performance 5.-6.12.
2014		Geochemicsty Days, Espoo 5.2.2014	Project newsletter 1	MUTKU days in Tampere, 2.-3.4.2014	1. Environmental Geochemistry course in Rovaniemi 7.5.2014; 2. Messut ja seminaarit. www.kaivosmessut.fi. 21.-22.5.2014, Oulu; 3. ASROCKS event 13.5. Hämeenlinna; 4.18th Conference on Environment and Mineral Processing & Exhibition (26-31)	1. KAIVOS-SEMINAARI 2014. Oulu 4.-6.6.2014. Oulun yliopisto; 2. Sustainability through Resource Conservation and Recycling '14 (UK, 12-13); 3. 5/6 Green Week Brussels		1. 28.8.2013 - Suomen Kaivosyrittäjät ry järjestää Kaivosseminaarin 2014 Oulussa; 2. International Conference on Mining, Material and Metallurgical Engineering (11-12)	1. Absoils international event (11-12.9)	UUMA2-seminar 7.10.2014		1. 17.2.2014 - Kestävä Kaivosinvestointi 2014 -seminaari; 2. the Optimass project seminar in Gothenburg 2.12.2014
2015				the International Mass stabilisation conference in Lahti, 22.-24.4.	EuroMining 21.5.2015; 2. Precious Metals '15 (UK)	The ninth International Conference on the Environmental and Technical Implications of Construction with Alternative Materials "WASCON 2015" in Santander, Spain, 10-12.6.						Networking in Horizon2020 event in Fimecc, Tampere 3.12.2015
2016				Geoday in Tallinn, Ramboll Finland Oy 22.-23.4.2016	Ympäristöseurontojen uudet tuulet - Training day, SYKE, Helsinki	Article in Europa Nu webpage				project presentation for LIFE Hungary Capacity Building Project in Espoo, Finland, meeting and presentation 27.10.	Ygoforum seminaari 2.11.2016	Press release; newspaper article in Sydän-Hämeen lehti
2017		1. the Kaivosaltaat seminaari (Mining basins seminar) 15/02/2017 in Helsinki; 2. UPACMIC presentation at Laivakangas mine, 16.2.2017		Ash Trade Conference 06 April 2017 in Tallinn, Estonia	1. presentation on LIFE project experiences, invited by LIFE Hungary Capacity Building Project in Budapest, Hungary, 10.5., 2. LIFE info day in Helsinki 22.05.	13th International Mine Water Association Congress in Lappeenranta, Finland (25/6-30/6/2017)		Newspaper article in Uusiouutiset			"Kaivannaisjätteiden ekotehokas hallinta - KaiHaMe-projektin työpaja" 28 November 2017 in Kuopio, Finland	
2018		Pidä Lappi siistinä" seminar 01-02 February 2018 in Kittilä, Finland; 2. MASU seminar 1.-2.2.2018, Tallin			1. Press release; 2. YM workshop Helsinki 28.5.2018	WASCON2018, international conference 06-08 June 2018, Tampere, Finland		1. Project newsletter 2; 2. Article in Uusiouutiset magazine		Test program of contaminated soils, final seminar, Helsinki 1.10.2018	Environmental protection day of mines 2018, UPACMIC poster presentation, Helsinki, 6.11.2018; 2. Ygoforum seminar, Helsinki, 14.11.2018	
2019	Future mine and minerals 2019 seminar, Stockholm (28-29/01/2019)				Sustainable Built Environment, Helsinki (22/05/2019)	World Circular Economy Forum 2019 in Finlandia Hall (03-04/06/2019)				Sardinia Symposium 2019, UPACMIC project presentation (30/09-04/10/2019)		
2020				1. Press release; article in International Mining webpage and Ramboll intra webpage; 2. Project newsletter 3	Finnmateria 2020 - symposium (cancelled)							Kiertotalous ja kaivosympäristö – Kiinteä jäte ja vedet -yhteisseminaari 01.12.2020 - 02.12.2020
2021			Kaivosten ympäristösuojelupäivät, virtual event (16/3/2021)	Project newsletter 4	Environmental ministry virtual education event concerning mining industry BAT 12/5/2021.						presentation at Uusiomaarakentamisen vuosiseminaari (10/11/2021), recovered materials in groundworks seminar	
2022		1. Project newsletter 5; 2. presentation in Kaivosteollisuus ry, R&D webinar (16/02/2022)	1. UPACMIC FINAL SEMINAR: Uudet mahdollisuudet kaivosympäristöjen kiertotaloudessa ja kestävässä kehityksessä - webinar (16/03/2022); 2. IMCET conference 22-25.3.2022, paper publication	1. An Article and project reference and Ramboll webpage; 2. An article in Kiertotalouden uutiskirje; 3. presentation and project video at MASU seminar (08/04/2022)	Article in Uusiouutiset magazine							

Annex 2

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LIFE PROJECTS MAPPED FOR NETWORKING

- **LIFE ReSoil - LIFE12 ENV/SI/000969**
  Demonstration of innovative soil washing technology for removal of toxic metals from highly contaminated garden soil
  2013-2018

http://liferesoil.envit.si/?page_id=138

Project goals:

The aim of the project is a successful local and international demonstration of innovative soil washing technology for removal of toxic metals from highly contaminated soil.

The work plan consists of the following activities:

- Design of the demonstration plant for the treatment of contaminated soil.
- Construction of the facility equipped with all mechanical and electrical equipment needed to achieve soil remediation capacity of 6 tons of soil per day.
- Remediation of 2200 tons of soil or approximately one hectare of land.
- Elaboration of implementation plan for delivering of contaminated soil into the demonstration plant
- Dissemination of the technology to achieve acceptance of the technology in the area of project.
- Implementation and promotion of the technology abroad.
- Monitoring of environmental and socio-economic impacts of the project.

- **I+DARTS - LIFE11 ENV/ES/000547**

  Innovative and Demonstrative Arsenic Remediation Technologies for Soils

  2012-2016

https://webgate.ec.europa.eu/life/publicWebsite/index.cfm?fuseaction=search.dspPage&n_proj_id=4267

The 'I+DARTS' project aims to demonstrate the technical and economic feasibility of using best available technologies in real scale to offer more advanced and sustainable soil remediation solutions for regions undergoing industrial restructuring. It expects to deliver a decision tool that will enable the selection of the most appropriate technique for remediation of specific contaminated sites and thus facilitate decontamination efforts in other areas. The project plans to conduct pilot actions of a variety of techniques for the remediation of soils contaminated by arsenic and heavy metals.

- **GREENROAD - LIFE11 ENV/ES/000623**

  Fostering GREEN Public Procurement in ROAD construction through the validation of high-performance asphalt eco-mixtures

  2012-2015

http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=4209

Project goals:

- Offer a green and economically viable alternative to the road construction sector;
- Break down all current barriers to the widespread implementation of GPP and set an example of a sustainable municipality;
- Validate an initiative to valorise the large amounts of steel slag generated in the region; and
- Facilitate a new and wider market for steel slag and reclaimed roads.

- **GtoG - LIFE11 ENV/BE/001039**

  GtoG: From Production to Recycling, a Circular Economy for the European Gypsum Industry with the Demolition and Recycling Industry

  2013-2016

https://webgate.ec.europa.eu/life/publicWebsite/index.cfm?fuseaction=search.dspPage&n_proj_id=4191

The overall objective of the GtoG project was to achieve a higher recycling rate for gypsum waste, by demonstrating the economic feasibility of transforming it into a valued resource. The project aimed to firstly focus on deconstruction practices to demonstrate the feasibility and advantages of deconstruction

versus demolition; to process the waste to separate gypsum from other materials; and then to incorporate the recovered gypsum into a manufacturing process, with an assessment of technical difficulties, options and solutions. A pilot study was executed by the project partners in partnership with gypsum manufacturers. The project planned assessments throughout of the carbon footprint and the methods to mitigate it at the construction, transport, processing and manufacturing levels.

- **CDW-recycling - LIFE11 ENV/FR/000752**

  Innovative solution for the separation of construction and demolition waste

  2012-2015

https://webgate.ec.europa.eu/life/publicWebsite/index.cfm?fuseaction=search.dspPage&n_proj_id=4187

The CDW-recycling project's main objective was to improve the CDW sorting process, by establishing a pilot plant capable of sorting smaller pieces at industrial scale and separating non-inert waste from inert waste. It aimed to demonstrate the possibility of recovering large quantities of CDW and with less of an environmental impact than using traditional management techniques. First, the CDW-recycling project planned to design and set up sorting processes for CDW fractions of 8-30 mm and 30-80 mm, adapting the optical and blowing technologies of project partner Pellenc Selective Technologies for industrial use. It then aimed to determine the optimal specifications during pilot testing, followed by integration of the new process into the waste sorting systems at the beneficiary SEAs site in Nice-Saint Isidore.

- **LIFE-GREEN4GREY - LIFE13 ENV/BE/000212**

  Innovative design & development of multifunctional green & blue infrastructure in Flanders grey peri-urban landscapes

  2014-2019

http://www.green4grey.be/en/about-green4grey

Project aims to convert the scarce remaining open space fragments in a greying peri-urban context into ecological stepping stones with a multifunctional character.

The project is based upon 5 corner stones:

- Natural landscapes in a peri-urban environment
- Integrated planning for multiifunctional land use
- Participative design
- Together with private companies
- Towards an innovative blue/green policy

- **SEKRET Life - LIFE12 ENV/IT/000442**

  Sediment ElectroKinetic REmediation Technology for heavy metal pollution removal

  2014-2017

http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=4545

The project will demonstrate, through several actions, that sediment dredged from port waters, and characterised by heavy metal and hydrocarbon concentrations above acceptable standards, can be treated in a specifically equipped Confined Disposal Facility using electrokinetic remediation (EKR). The project will demonstrate the environmental and economic benefits of this solution over landfilling.

- **WISER LIFE - LIFE13 ENV/IE/000763**

  Working with Industrial Spaces to Exemplify Reuse

  2014-2018

https://webgate.ec.europa.eu/life/publicWebsite/project/details/4027

The main objectives of the WISER LIFE project were to reduce and reuse waste, divert it from landfill, create green jobs, reduce resource consumption, and improve access to innovative ecological education systems. It built upon the activities of coordinating beneficiary RDC, in demonstrating best practice in waste reuse and preparation for reuse, and associated beneficiaryDCC, which was set up by the Dublin City Council to develop and implement a plan for the physical, economic and social regeneration of Ballymun. The project aimed to create an innovative education centre to demonstrate excellence in reuse, supported by a cluster of resource-efficient enterprises, and complemented by environmental education, training and research programmes.

- **LIFE SAM4CP - LIFE13 ENV/IT/001218**

  Soil Administration Models 4 Community Profit

  2014-2018

http://www.sam4cp.eu/progetto/

The project will allow to make available new tools for better planning, management and use of the land, with particular attention to the mapping and evaluation of ecosystem services, intended as tangible and intangible benefits that man can draw from this natural resource.

- **LIFE HUELLAS - LIFE12 ENV/ES/000686**

  LCA, environmental footprints and intelligent analysis for the rail infrastructure construction sector

  2014-2018

http://www.life-huellas.eu/

Project goal is the development of methodologies and tools to optimize decision making process, reducing carbon and water footprints of railway infrastructure construction related projects. For that purpose, the project will review and analyze the environmental impact of every stage in the construction process.

- **EKOHEMPKON - LIFE11 ENV/PL/000445**

  Remediation of degraded land in the region of Lignite Mine Konin by cultivation of industrial hemp

  2012-2018

http://ekohempkon.iwnirz.pl/

Project goal is accelerated agricultural reclamation of post-mining areas using two plants, ie. hemp and alfalfa. The implementation of the project will allow the restoration of degraded areas to agriculture. The creation of a demonstration rehabilitation facility will improve the environmental situation in the area of the Kazimierz Biskupi open-pit mine.

- **SNOW-LIFE - LIFE13 ENV/IT/001203**

  Slag NO Waste: Innovative system for 100% recycling of white slag and for ZERO WASTE electric steel production

  2014-2018

https://webgate.ec.europa.eu/life/publicWebsite/index.cfm?fuseaction=search.dspPage&n_proj_id=5107

The project's main goals focus on demonstrating the potential of SNOW technology to act as a cost-effective waste reduction and reuse solution for white slag (and associated frazzled refractory linings) from EU steel plants. An innovative system will be tested to verify optimal operational parameters for recovering free lime, dololime and magnesium oxide from white slag and exhausted refractory materials. The recovery process will include reintroducing the materials directly back into the same steelmaking process, thereby substituting 30-50% of the lime additive presently purchased.

- **CIRCWASTE – LIFE15 IPE/FI/000004**

  Finland towards circular economy

  2016-2023

https://www.materiaalitkiertoon.fi/en-US/Circwaste

CIRCWASTE is a seven-year LIFE IP project that promotes efficient use of material flows, waste prevention and new waste and resource management concepts. All actions contribute to implementing the national waste management plan and directing Finland towards a circular economy. CIRCWASTE is a creation of 20 partners and 10 funding organisations. The project is coordinated by the Finnish Environment Institute. CIRCWASTE is funded in large part by the EU LIFE programme.

- **LIFE ASH 2 MATERIAL – LIFE18 ENV/NL/000436**

  Integrated full-scale treatment facility for different fractions of bottom ash ensuring safe use as secondary material

  2019-2022

https://www.heros.nl/nl/life/

This project aims to demonstrate an integrated, full-scale treatment facility for the different fractions of bottom ash; as each fraction has its own environmental challenges. By demonstrating the technical and economic feasibility, the project contributes to the objectives of EU environmental policy and the circular economy. The objectives are directly aligned to the aims of LIFE. By focusing on an integrated approach, the project will recycle and recover materials that will otherwise not be recovered – or recycled in low-quality applications.

- **LIFE No Waste - LIFE14 ENV/PT/000369**

  Management of biomass ash and organic waste in the recovery of degraded soils: a pilot project set in Portugal

  2016-2021

https://lifenowaste.pt/s/

The LIFE No_Waste project aimed to evaluate, demonstrate and disseminate the sustainable use of ash (from forest biomass residues combustion) combined with organic waste materials (sludge from the pulp and paper industry or compost) to regenerate degraded soils from mining areas, in compliance with the EU Thematic Strategy for Soil Protection.

The project also aimed to reduce the impact of wastes from the pulp and paper industry on the environment, while making better use of valuable resources according to the end-of-waste criteria, while also contributing to the mitigation of greenhouse gas (GHG) emissions. A pilot-scale application of soil additives, produced by the mixture of ash with organic waste materials, would demonstrate soil recovery in three degraded mining areas (on a total of 12 test plots of 100 m2 each) located within the Iberian Pyrite Belt in Portugal.

- **LIFE CarbonGreen - LIFE20 ENV/NL/000200**

  Sustainable recycling of (Carbon) Fibre Composites and biomass waste to valued added CarbonGreen products

  2021-2024

https://carbongreen.eu/get-involved/

The overall objective of the LIFE CarbonGreen project is to scale-up the "ThorSpin" process and demonstrate its cost-effectiveness and value to convert Carbon (Glass) Fibre Reinforced Polymer Composites (CFRP and GFRP) waste from end-of-life wind turbines and other carbon rich waste streams (biomass, manufacturing scrap) into into high-value micro-carbon. The ThorSpin process is based on energy-efficient and waste-less mechanical chemistry technology, which has been developed by the project partners. Micro-carbon will be used to produce its CarbonGreen (CG)-products. The project also aims to optimize and characterise these CG-products to ensure their market acceptance by different industries. It is expected that the technology will reach TRL 8 at project end and demonstrate the feasibility of the ThorSpin and CG-products in real-world environments.

The project supports the Roadmap to a Resource Efficient Europe, the implementation of the Circular Economy Action Plan, the European Green Deal, the Waste Framework Directive, and the Water Framework Directive.

- **LIFE CFCycle - LIFE20 ENV/DE/000312**

  Low energy chemo-thermal recycling of carbon fibre composites, a central step to a circular economy for CFRP products

  2022-2025

https://www.v-carbon.com/v-carbon-life-project/

The project aims to implement and evaluate a low-energy approach for recycling carbon fibre reinforced polymers (rCF). This will be achieved by a low-temperature and low-pressure chemical recycling process known as chemolysis. Specifically, the project aims to:

- Establish and evaluate the recycling process for fibre material from at least 10 different scrap typologies;
- Carry out technical evaluation of the demonstration and monitoring of performance, environmental monitoring;
- Facilitate recycling of up to 95% of fibre material and 90% of binder polymers from CFRP scrap;
- Prepare a life-cycle-analysis for rCF from chemolysis and verify the sustainability of energy and mass balance against virgin carbon fibre and pyrolysis-recycling of CFRP;
- Establish a supply chain for CFRP scrap that ensures the supply of at least 1 000 tonnes of CF-scrap per year to the plant;
- Demonstrate a process that provides rCF at €5/kg to €9/kg;
- Demonstrate further processing of rCF in at least three different applications; and
- Establish an industrial supply chain for the re-use or processing of recovered matrix polymers.

- **LIFE BioLubridge – LIFE20 ENV/IT/000452**

  Biolubricants from urban sewage sludge

  2021-2024

https://webgate.ec.europa.eu/life/publicWebsite/project/details/5735

The main objective of the LIFE BioLubridge project is to demonstrate the possibility to use an alternative method aimed at obtaining bio-lubricants from sewage sludge, with reduced environmental impact. The specific objectives of the project are to:

- Optimise and demonstrate an innovative technology capable of recovering at least 50% of the lipids present in sewage sludge, to be transformed into valuable products for the production of bio-lubricants ready for application in the automotive, metal working and other sectors. In particular, by processing 1 m3 of raw dewatered urban sewage sludge (containing 10% of total solids), 5 kg of lipids will be recovered and reacted to obtain up to 7 kg of esters of ethylhexanol, to be directly tested as bio-lubricants. By the end of the project, 3.5 tons of final products are expected to be produced;
- Improve the dewaterability of residual sewage sludge (reducing water content by 75%), avoiding to the largest extent possible the use of any polyelectrolytes;
- Evaluate the possibility to directly use the residual dewatered and biologically sanitised residual sludge in agriculture as fertiliser, preventing possible leakage of contaminants into surface and groundwater;
- Shorten the duration of the overall treatment of sludge from 15 days (typically necessary for an anaerobic digestion) to 6-12 hours, allowing the direct disposal of the final centrifuged sludge.

- **LIFE WASTE2BUILD - LIFE20 GIE/FR/000118**

  Using the Waste Demolition to Build within a Circular Economy approach

  2021-2026

https://webgate.ec.europa.eu/life/publicWebsite/project/details/5626

The LIFE WASTE2BUILD project aims to develop new circular construction and public works streams, and to prevent at source construction and public works waste based on local resources, by using the levers of public ordering and refurbishment policies. The project will set up an innovative system to optimise resources and recover waste from the local construction and public works sector.

The specific objectives include:

- Reducing the impact of construction and public works on resource consumption and waste production by 35% on the territory of Toulouse Metropole;
- Changing practices in the building sector thanks to new tools and processes;
- Systematising the circular economy in the public procurement construction sector; and
- Disseminating the circular approach of construction.

- **LIFE ZEROSILIBRINE – LIFE20 ENV/ES/000522**

  Valorisation of precipitated silica wastewater through circular economy strategy for sodium sulphate and water recovery.

  2021-2024

https://webgate.ec.europa.eu/life/publicWebsite/project/details/5590

LIFE ZEROSILIBRINE is a pilot project to demonstrate the application of an innovate technology for the treatment of precipitated silica wastes, an environmental challenge with no feasible current solution.

The specific objectives are the following:

- Demonstration of the technical feasibility of the reverse osmosis stage by means of the 40m3/h installation recovering 80% volume of the production process effluent of precipitated silica reusing the water recovered in the same production process;
- Validation of the operating costs of the reverse osmosis process and validation of the economic feasibility of the manufacture of high purity anhydrous sodium sulphate;
- Validation and optimisation of the evaporation-crystallisation stage with a small prototype (1-2m3/h) from 80% to 100% of the discharge volume until obtaining a commercial anhydrous sodium sulphate;
- Study the anhydrous sodium sulphate by-product characteristics with primary sodium sulphate manufacturer;

- Study the potential technology replicability and transfer to other chemical processes and/or industrial sectors.

- **LIFE Waste To Resources IP - LIFE20 IPE/LV/000014**

  Waste To Resources Latvia - boosting regional sustainability and circularity

  2021-2028

https://webgate.ec.europa.eu/life/publicWebsite/project/details/5808

The overall aim of this integrated project (IP) is to reduce waste generation, through measures that lead to improved material recovery and circularity and reduce the environmental and carbon footprint of the economy, by fully implementing the measures set out in the Latvian National Waste Management Plan 2021-2028 (NWMP2028).

The specific objectives are to:

- Improve the separated waste collection system by piloting complex management approaches for priority waste streams (biological and food waste, textiles, electronics and information and communications technology, packaging waste, etc.) and ensuring the safe disposal of specific types of hazardous waste;
- Set up a circular system for recycled building materials, including re-use and recycling, sorting of construction waste at construction sites, and improvement of building materials and waste accounting;
- Improve and advance the market for secondary raw materials, reusable and recycled goods, by establishing preconditions and enabling policy instruments;
- Reduce the amount of waste landfilled by improving waste sorting and recycling, including treatment of non-recyclable fractions of municipal solid waste;
- Increase material resource productivity and promote waste prevention and reduction of greenhouse gas emissions in all spheres of the economy;
- Promote synergies among industrial production, eco-innovation and waste prevention;
- Improve waste management planning at the national and regional level and its implementation mechanisms through strategically planned capacity-building actions;
- Address gaps in the accounting and monitoring system of waste flows to ensure a more efficient implementation of the NWMP2028 in further planning cycles;
- Expand and deepen cooperation among stakeholders, as well as establishing and strengthening cooperation with neighbouring countries, for more sustainable waste management; and
- Carry out comprehensive and proactive public information, education and awareness-raising work to ensure the involvement of various stakeholders in implementation of the NWMP2028 and regional waste management plans, by changing their attitudes and behavioural patterns in regard to consumption, waste production and reuse, including societal choices in the context of climate change mitigation.

- **LIFE CE STARSEED - LIFE20 NGO4GD/BG/000017**

  LIFE Circular Economy for Sustainable Future - Bulgarian Civil Society for the European Green Deal

  2021-2023

http://www.club2000.org/en/projects_info/430.html

The general objectives of the project are:

- to increase the knowledge of civil society organizations and businesses about the circular economy and their motivation and participation in public dialogue on key documents and topics at the national level related to the circular economy;
- to catalyse behaviour change and the implementation of sustainable circular economy models among stakeholders.

The objectives of the project will be achieved through various actions, including:

- organizing public discussions and information campaigns,
- conducting training consultations,
- presentation and exchange of good practices,
- initiation and implementation of innovative models in the field of circular economy.

- **LIFE-IP CE Beyond Waste - LIFE20 IPE/DK/000001**

  Circular Economy Beyond Waste

  2022-2029

https://webgate.ec.europa.eu/life/publicWebsite/project/details/5809

The LIFE-IP CE Beyond Waste project aims at the full implementation of the Danish Action Plan for Circular Economy (APCE) in a way that reinforces and accelerates the shift to a circular economy, to keep resources at the highest possible level of the waste hierarchy for as long as possible.

The three main objectives of the project are:

- Waste prevention: To prevent waste generation and reduce consumption of primary resources by introducing and integrating circular approaches in the actions and behaviour of public authorities, private enterprises as well as among citizens;
- Circular waste management: To turn waste into resources by implementing circular economy practices in the treatment of waste, realise markets for reuse and secondary raw materials, and innovate waste monitoring to include effects of circularity and thus incentivise the circular economy;
- Regulation: To improve the regulatory framework, governance, and incentives for circular economy, waste prevention and circular waste management, by identifying regulatory barriers to circularity and providing feedback and guidance to political and administrative decision-makers.

- **LIFE IP RESTART - LIFE20 IPE/SI/000021**

  Boosting waste recycling into valuable products by setting the environment for a circular economy in Slovenia

  2022-2030

https://webgate.ec.europa.eu/life/publicWebsite/project/details/5813

LIFE IP RESTART will focus on overcoming the obstacles to achieving EU recycling targets, and on achieving the full implementation of the National Waste Management Programme and Waste Prevention Programme (WMPP) in Slovenia. The project's main objective is to deploy a holistic set of complementary technical, digital, environmental, social and circular solutions to unlock all the potentials of the WMPP, to achieve maximum material self-sufficiency and increased circular yield in the waste-to-resource sector. In order to achieve this main objective, project activities will be aimed at achieving three specific objectives:

- To provide a continuous WMPP assessment mechanism and ensure its ongoing improvement and actualisation, based on digital, technical and social excellence established by the project;
- To demonstrate 6 circular solutions for several problematic and voluminous waste streams, as best-case examples for implementing WMPP objectives;
- To ensure wider uptake of best available solutions and to achieve a coherent and integrated implementation of WMPP objectives.

- **LIFE FRAC-IN - LIFE20 ENV/BE/000597**

  Enabling in situ soil remediation on low-permeability sites through hydraulic/pneumatic fracturing (FRAC-IN)

  2022-2025

https://webgate.ec.europa.eu/life/publicWebsite/project/details/5681

The LIFE FRAC-IN project aims to:

- Validate the FRAC-IN technology in different field environments covering a range of geological conditions and contaminants, as well as support full-scale applications of the technology at other sites;
- Establish a framework for determining the FRAC-IN technology's feasibility in terms of economic, environmental and technical considerations; and
- Promote the FRAC-IN technology in EU policy on soil remediation and brownfield redevelopment.

- **LIFE RIBERMINE - LIFE18 ENV/ES/000181**

Fluvial freshwater habitat recovery through geomorphic-based mine ecological restoration in Iberian Peninsula

2019-2024

https://webgate.ec.europa.eu/life/publicWebsite/index.cfm?fuseaction=search.dspPage&n_proj_id=7195

LIFE RIBERMINE aims to minimise hydro-morphologic pressures and improve the water quality of two areas affected by different types of mining (metal and non-metal) in two EU countries, Spain and Portugal, in line with the objectives of the Water Framework Directive (2000/60/EC).

Specifically, the project aims to:

- reduce hydro-morphological pressures and both physical and chemical pollution in freshwater bodies by improving the water quality and dynamics in two river basins the Tagus Basin and the Corona Basin after restoring two severely degraded areas (derelict mining exploitations); and
- apply and adapt a combination of the Best Available Techniques (BAT) for mine restoration, based on fluvial-geomorphic solutions, used so far only at a pilot scale, on larger areas (demonstration project) and transfer these techniques to other mine-degraded areas in the EU.

- **LIFE BRINE-MINING - LIFE18 ENV/GR/000019**

  Demonstration of an advanced technique for eliminating coal mine wastewater (brines) combined with resource recovery

  2019-2024

https://brinemining.eu/en/home/

LIFE BRINE-MINING aims to facilitate the implementation of the Water Framework Directive and the Circular Economy package by enabling the coal mining industry to improve its wastewater management performance in a way which yields cost-effective, resource efficient and legally compliant results. It will develop and apply an economically viable, innovative system to eliminate products from and fully recover resources in coal mining wastewater, at source. The system will be able to treat and directly recover end-products (minerals/salts and water) of high quality and purity.