# UPACMIC - LIFE12 ENV/FI/000592
# After LIFE Communication Plan 2022-2027


LIFE12 ENV/FI/000592

Ympäristöministeriö
Miljöministeriet
Ministry of the Environment

RAMBØLL

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UPACMIC

## WHAT?

Utilization of alternative construction materials in new mining facilities and remediating the existing ones.

## WHY?

Alternative construction materials replace non-renewable natural materials such as eskers and moraines, as well as commercial sealing products like bentonite mattes and geomembranes.

## HOW?

Various mixtures of waste and by-product materials are utilised. These methods has already been applied in infrastructure development projects.

The technology is implemented in the mining industry for the first time.

# THE MAIN ACHIEVEMENTS OF THE PROJECT

- ✓ **5 pilot structures implemented**
  - o The use of fiber clay in cover structure, Hitura Mine area
  - o The use of surplus soil (clay) in the closure of the crushed rock area, Hitura Mine area
  - o The use of geopolymers and limestone barrier for the purification of seepage water, Hitura Mine area
  - o The use of reactive mat (Tektoseal) for the purification of seepage water, Hitura Mine area
  - o The use of water treatment sludge from Hitura, industrial by-products and surplus soils in vertical sealing barrier, Sorsasalo Kuopio
- ✓ **71% virgin natural materials replaced**
- ✓ **176 500 tons of non-renewable natural materials saved**
- ✓ **30 ha bentonite mattes saved**
- ✓ **Numerous material recipies produced**
- ✓ **Guidelines and results are available at projects website**

Fiber clay

Picture: Ramboll

Picture: Ramboll

Reactive structures

Picture: Ramboll

Picture: Ramboll

Surplus soil

Picture: Ramboll

Picture: Ramboll

Vertical sealing barrier

Picture: Fortum

Picture: Fortum

# DISSEMINATION DURING THE PROJECT

Actions

- ✓ Participation in 42 events
- ✓ 2 workshops organized
- ✓ Participation in 3 conference
- ✓ 4 conference articles
- ✓ Article in a professional magazine, Materia-lehti
- ✓ Guideline
- ✓ 5 newsletters
- ✓ 10 news articles
- ✓ 3 interviews

Tools

- ✓ 17 project presentations
- ✓ Project procure
- ✓ Project poster
- ✓ Layman´s Report
- ✓ 2 project videos, in Finnish and English
- ✓ Project logo ja gif-animation
- ✓ Twitter account
- ✓ LIFE information boards
- ✓ Project website
- ✓ Project materials available at website

Effect of communication

- ✓ Raising awareness of the alternative material solution possibilities
- ✓ Raising awareness among a wider audience in an understandable way
- ✓ Presentation of the practical pilot results to the target audience
  - ➢ Alternative materials can be utilized safely, ecologically and cost-effectively.
  - ➢ According to KAP survey results, UPACMIC projects most interesting topics are waste materials to products and environmental monitoring. Obtaining research-based information is considered important.
  - ➢ Awareness in the industry has grown and the attitude is positive. However, more practical pilots are hoped to be carried out at new sites. The road from piloting stage to commonplace method is long.

# AFTER LIFE

## THE FUTURE OF PILOT STRUCTURES

- ✓ The cover structure made with fiber clay is a permanent structure. Monitoring will continue in accordance with the instructions of the environmental permit authorities by Fortum Waste Solutions.
- ✓ The surplus soils used at crushed rock area is a permanent structure. Monitoring is not required.
- ✓ The use of reactive structures (geopolymer, limestone barrier and ja reactive mat) continues. New studies are also planned for the structures. After life study and monitoring of the reactive structures are implemented by Feasib Analytics.
- ✓ The vertical sealing barrier is located at industrial waste landfill, Kuopio. The structure is permanent and monitoring will continue in accordance with the environmental permit by Fortum Waste Solutions.

# THE USE OF THE MINING AREA IN THE FUTURE

- ✓ The world's first industrial-scale solar power plant is planned to be built on top of the tailings ponds of the Hitura and Pyhäsalmi mines, which is expected to generate approximately 90 GWh of electricity annually
  - ➢ Large flat areas are thus put to practical use.
    - No need for clearing a new area.

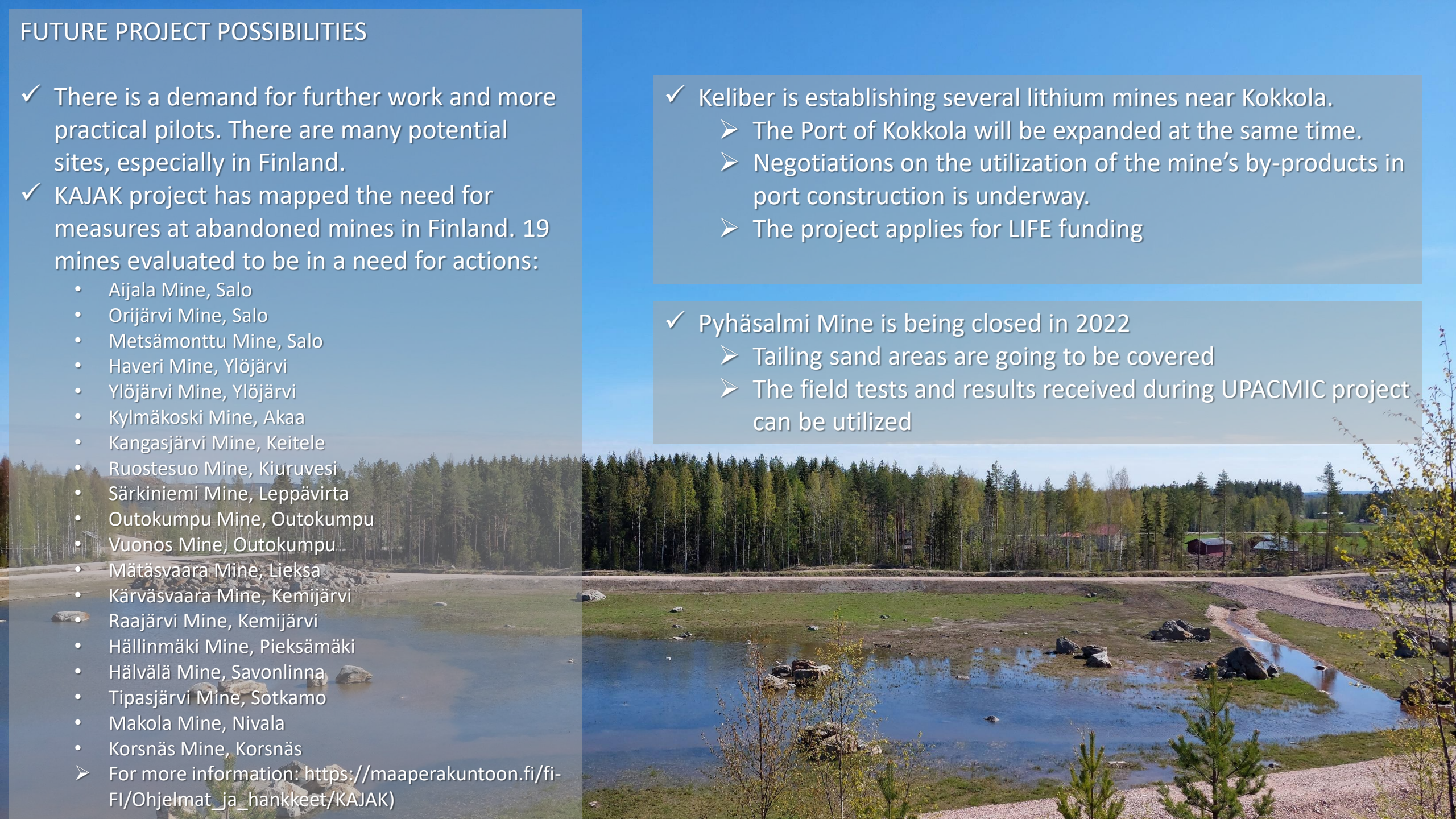
- ✓ Possibilities for the future use of the Hitura mine were studied in the KAIVASU project
  - ➢ Even today, the slopes of the side rock piles are used by a local farmer to graze cattle. Local farmers also have hopes to get some more land area for farming.
  - ➢ Other possible re-use opportunities include for example outdoor activities, motorsports, downhill skiing, an adventure park and bird watching. Incorporating the mining environment into existing trails and routes around the mine would provide additional opportunities for downhill biking, jogging path, frisbee golf, and other sports activities throughout the year
  - ➢ From a tourist point of view, the area could be used, for example, as an observation deck and related services, or for mining area hiking, where one would also learn about the history of the area.
  - ➢ In the planning of re-use it is necessary to acknowledge the durability of any cover and protection structures and the possible restrictions caused by them, as well as requirements and liabilities of the area.

# FUTURE PROJECT POSSIBILITIES

- ✓ There is a demand for further work and more practical pilots. There are many potential sites, especially in Finland.
- ✓ KAJAK project has mapped the need for measures at abandoned mines in Finland. 19 mines evaluated to be in a need for actions:
  - Aijala Mine, Salo
  - Orijärvi Mine, Salo
  - Metsämonttu Mine, Salo
  - Haveri Mine, Ylöjärvi
  - Ylöjärvi Mine, Ylöjärvi
  - Kylmäkoski Mine, Akaa
  - Kangasjärvi Mine, Keitele
  - Ruostesuo Mine, Kiuruvesi
  - Särkiniemi Mine, Leppävirta
  - Outokumpu Mine, Outokumpu
  - Vuonos Mine, Outokumpu
  - Mätäsvaara Mine, Lieksa
  - Kärväsvaara Mine, Kemijärvi
  - Raajärvi Mine, Kemijärvi
  - Hällinmäki Mine, Pieksämäki
  - Hälvälä Mine, Savonlinna
  - Tipasjärvi Mine, Sotkamo
  - Makola Mine, Nivala
  - Korsnäs Mine, Korsnäs
  - ➢ For more information: https://maaperakuntoon.fi/fi-FI/Ohjelmat_ja_hankkeet/KAJAK)

- ✓ Keliber is establishing several lithium mines near Kokkola.
  - ➢ The Port of Kokkola will be expanded at the same time.
  - ➢ Negotiations on the utilization of the mine's by-products in port construction is underway.
  - ➢ The project applies for LIFE funding

- ✓ Pyhäsalmi Mine is being closed in 2022
  - ➢ Tailing sand areas are going to be covered
  - ➢ The field tests and results received during UPACMIC project can be utilized



## COMMUNICATION MATERIALS

- ✓ All the communication materials are available at projects website
  - ➢ The materials increase awareness about the possibilies of alternative material utilization and gives tools for designing and implementing future projects.
- ✓ The project partners use communication materials to present project results in the future events.
- ✓ The partners use the results achieved by UPACMIC project in future project negotiations and designing.
- ✓ The project webpage will be maintained at least 5 years after project end by Ramboll Finland.

## AFTER LIFE OPORTUNITIES FOR DISSEMINATION

- ✓ UUMA seminars 2023-
- ✓ Kaivosteollisuus ry seminars 2023-
- ✓ WASCON 2023 Conference
- ✓ International Conference on Mineral Deposits and Mining Methods ICMDMM, 2023
- ✓ International Conference on Green Coal Mining Techniques and Green Technologies ICGCMTGT, 2023
- ✓ International Conference on Mining Technologies and Sustainable Systems ICMTSS, 2023
- ✓ International Conference on Mining and Land Reclamation ICMLR, 2023
- ✓ International Conference on Land Reclamation in Mining Areas ICLRMA , 2023
- ✓ International Conference on Mining Technologies ICMT, 2023
- ✓ International Conference on Green Coal Mining Techniques and Waste Disposal ICGCMTWD, 2023

## PROJECT DATA

# UPACMIC - Utilisation of by-products and alternative construction materials in new mine Construction, LIFE12 ENV/FI/000592

- Reference: LIFE12 ENV/FI/000592
- Acronym: LIFE+ UPACMIC
- Start Date: 01/07/2013
- End Date: 31/08/2022
- Total Budget: 5,278,182 €
- EU Contribution: 2,500,339 €
- Project Location: Finland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https://projektit.ramboll.fi/life/upacmic/index.html