

ABSOILS - LIFE09 ENV/FI/000575

Sustainable Methods and Processes to Convert Abandoned Low-Quality Soils into Construction Materials

UPACMIC - LIFE12 ENV/FI/000592

Utilisation of by-products and alternative construction materials in new Mine Construction



Networking with LIFE Hungary Capacity Building Project 27th October 2016

At Espoo Ramboll Office

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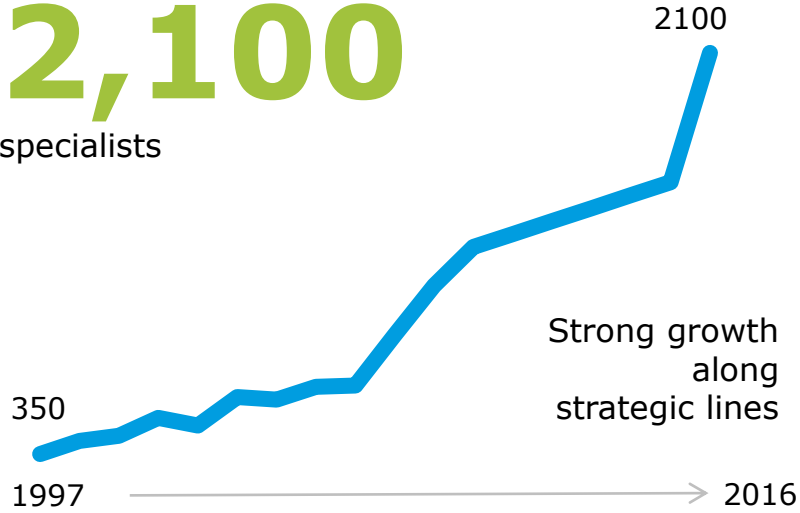
RAMBOLL GROUP



RAMBOLL IN BRIEF

2,100

specialists



Turnover 175 M€

- Infrastructure & Transport 63 M€
- Buildings 37 M€
- Environment & Health 29 M€
- Water 7 M€
- Project Management & Real Estate Consulting 37 M€
- Management Consulting 2 M€



Ramboll Group is the largest in the Nordics:

13,000

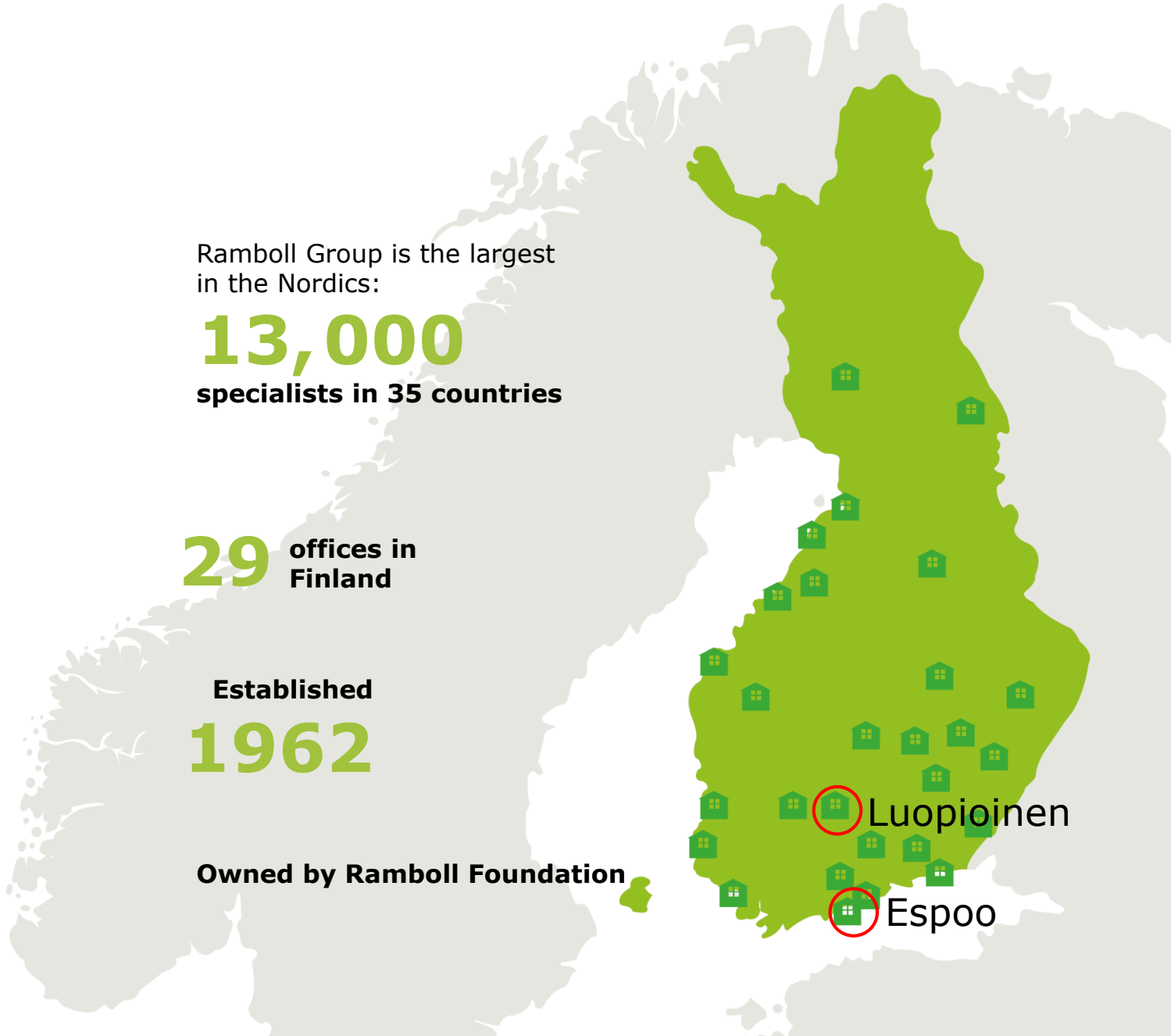
specialists in 35 countries

29

 offices in Finland

Established
1962

Owned by Ramboll Foundation



MARKET LEADER IN INFRASTRUCTURE AND TRAFFIC SYSTEMS ENGINEERING

Harbours

Rail traffic

Airports

Railways

Traffic

Bridges

Landscape
architecture

Public utility
services

Urban
planning

Road, street and
regional planning

Geotechnical
engineering

RAMBOLL

LUOPIOINEN OFFICE

ENVIRONMENTAL GEOTECHNICS R&D

Earth construction, waste and by-product utilisation expertise:

- Deep stabilizing, process stabilizing and layer stabilizing
- Geotechnical R&D laboratory (also waste and by-product material studies)
- Industrial by-product utilization for different earth constructions: roads, fields, ports, landfills
- Utilization of poor quality soils: dredged sediments, clays, silts, moraines and contaminated soils
- Product development of earth construction materials, guidance, productization and demonstrating of environmental eligibility



Geotechnical R&D projects:

- Utilization of surplus soils in the capital area (ABSOILS)
- New surface materials for playing fields
- UUMA and UUMA 2, national project for promoting the use of recovered materials in groundworks, close co-operation with the authorities (www.uuma2.fi)
- Productization of foamed glass (piloting, laboratory studies, guidelines and risk assessment)
- Utilisation of by-products and alternative construction materials in new Mine Construction (UPACMIC)
- Controlled Treatment of TBT-Contaminated Dredged Sediments for the Beneficial Use in Infrastructure Applications.
Case: Aurajoki – Turku, Finland (STABLE LIFE06 ENV/FIN/000195)
- LIFE IP CIRCWASTE FINLAND (LIFE/IPE/004)



LIFE12 ENV/FI/000592



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MAASTORAKENTAJAT
member of ANDAMENT GROUP

EKOKEM

UPACMIC PROJECT 2013-2020 (LIFE12 ENV/FI/000592)

- Start: September 2013 / End: August 2020
- Coordinated by Ramboll Finland (Luopioinen), coordinator Mr Pentti Lahtinen
- Project partners: Suomen Maastorakentajat and Ekokem
- Supported by the Finnish Ministry of the Environment and Yara
- Utilisation of by-products and alternative construction materials in new Mine Construction
- Project budget 5 278 182 euros
- EU contribution 2 500 339 euros



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UPACMIC PROJECT 2013-2020 (LIFE12 ENV/FI/000592)

- On the EU level, it has been estimated that more than 400 million tons of waste from the extractive industries is generated annually.
- There are currently 47 tailings impoundments in Finland and their size ranges from 1-900 ha and their volume varies from 10 000 -100 000 000 m³.
- Due to large size of the mining waste storage facilities, the construction of their bottom and cover structures requires a considerable amount of materials, both natural aggregates (e.g. eskers, rocks and top soils) and commercial sealing products.
- It has been estimated that the amount of CO₂ generated during the production of aggregates varies between 0,9-1,8 kg per tonne.
- The **objective** of the UPACMIC project is to demonstrate through its pilot applications various aspects of constructing the tailings ponds' bottom and cover layers, as well as the reactive barrier layers with secondary materials with the primary purpose of preventing contaminants leaching into ground waters.

ABSOILS PROJECT 2010-2015 (LIFE09 ENV/FI/000575)

- Start: September 2010/ end: June 2015
- Coordinated by Ramboll Finland (Luopioinen), coordinator Mr Pentti Lahtinen
- Project partners: Lemminkäinen (previously Biomaa) and Rudus
- Supported by the Finnish Ministry of the Environment and the Uusimaa cities - Helsinki, Espoo and Vantaa
- Total budget 2 736 363 euros, eligible 2 625 738 euros
- EU contribution 1 312 869 euros
- Sustainable Methods and Processes to Convert Abandoned Low-Quality Soils into Construction Materials



Lemminkäinen



Helsingin kaupunki



ABSOILS PROJECT 2010-2015 (LIFE09 ENV/FI/000575)

PROJECT BACKGROUND

- ABSOILS project came as a response to the problem of surplus excavated soft soils resulting from infrastructure development
- In the year 2009 the annual generation of excavated soils in Helsinki was about 0,6 million m³. At that time, 70% of this amount was landfilled
- In 2012, the landfill for surplus soil masses in Helsinki was closed down due to its exhausted capacity
- Transportation distance increased up to 40 km

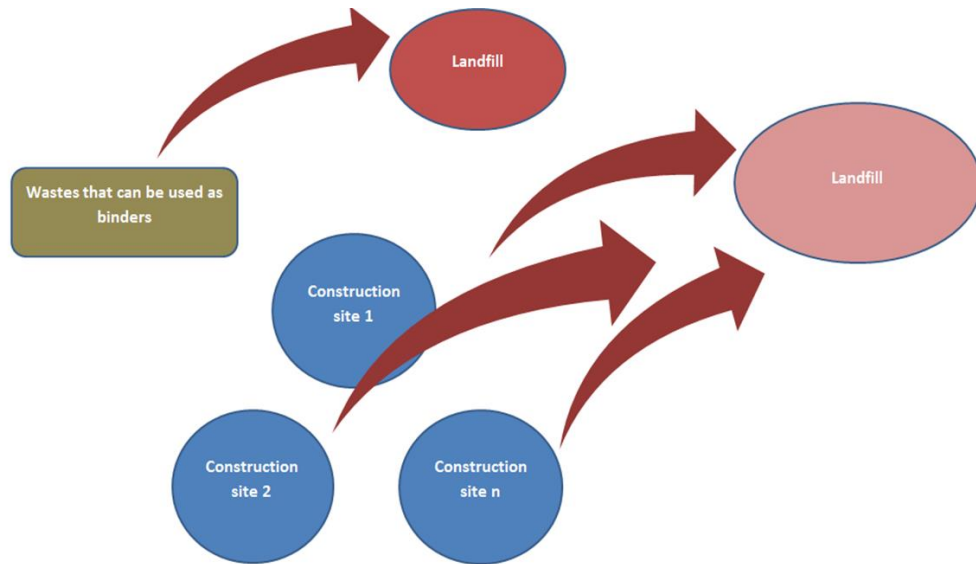
Needs

- Practical examples and ways of applying the European policies and legislation concerning waste (soils and other waste such as fly ash which can be utilised as a binding agent)
- Success stories promoting waste recovery and sustainable recycling with a focus on life-cycle and life-cost thinking and the development of recycling markets – material efficiency /examples to follow
- Technical and environmental information related to redundant soils and their conversion into useful earth construction materials – quality assurance and follow-up data

ABSOILS PROJECT 2010-2015 (LIFE09 ENV/FI/000575)

Linear model

Based on the assumption that resources are abundant, available, easy to source and cheap to dispose

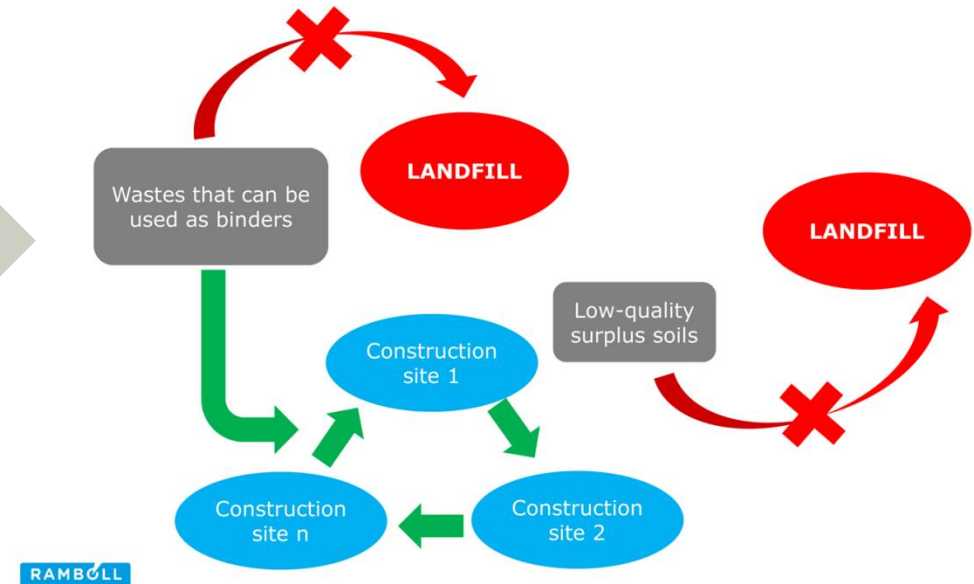


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Circular model

Surplus low-quality soils and wastes from energy production can be processed with the mass stabilisation method into construction material

ABSOILS



ABSOILS PROJECT 2010-2015 (LIFE09 ENV/FI/000575)

PROJECT AIMS

- To address the challenges of the European policies and legislation concerning waste
- To promote waste recovery and sustainable recycling with a focus on life-cycle thinking and the development of recycling markets
- To tackle the challenges related to the redundant soils and their conversion into useful earth construction materials



ABSOILS PROJECT 2010-2015 (LIFE09 ENV/FI/000575)

RESULTS

- The ABSOILS project has provided the stakeholders with new knowledge and guidance (European Guidelines) on the possibilities and methods of using earth construction materials based on various types of redundant, poor quality soils.
- The project has served as a successful example demonstrating environmental and economic benefits based on the utilisation of surplus soft soils for versatile engineering purposes.
- It is estimated that 4 million tons of surplus soils will be re-used in the capital region of Finland as the know-how on surplus soil utilisation possibilities improves all the time.
- As the utilization of surplus soils will eventually be an established method instead of landfilling, it is estimated that reduction of greenhouse gases (as CO₂ equiv.) may be approximately 1,2 million tons CO₂ yearly in Finland. Only in Helsinki, it is estimated that by surplus soil utilization, approximately 100-200 million euros can be saved every year.

ABSOILS PROJECT 2010-2015 (LIFE09 ENV/FI/000575)

DIFFICULTIES/CHANGES IN THE PROJECT

- Delays with the piloting schedules
- Changes in the applications due to environmental permits
- Associated beneficiary Biomaa changed to Lemminkäinen due to corporate acquisition
- Amendment due to budget issues and project prolongation (6 months)

UPACMIC PROJECT 2013-2020 (LIFE12 ENV/FI/000592)

DIFFICULTIES/CHANGES IN THE PROJECT

- The application was written and sent in 2012. During the evaluation period, the nickel price crashed causing market uncertainty and affecting also to UPACMIC partner Belvedere Mining and their nickel mine Hitura, where the piloting was supposed to take place
- Two associated beneficiaries from the original composition withdrew from the project quite soon after the project officially started, mainly because of the uncertain markets
- Negotiations with new associated beneficiaries (Suomen Maastorakentajat and Ekokem) were completed in 2014 and the official change (Amendment) of partners was informed to Commission in July 2014
- Due to the low nickel price all the activities in Hitura mine were run down, causing also delays in the UPACMIC project schedules
- Negotiations with other mines took place, and now the field tests and piloting will take place in Pyhäsalmi Mine (the company is not an official beneficiary in the project)
- The piloting was supposed to take place in 2015 but the new schedule for piloting is in 2017
- In December 2015 the Belvedere Mining went to bankrupt
- All Belvedere responsibilities were transferred to Ramboll since the project beginning, the Amendment for this change and project prolongation was accepted in October 2016

THANK YOU!

KIITOS!