Profile Status: Published

Technology Offer

Magnetic method for estimation of soil erosion and re-distribution

Summary

A Bulgarian research institute has developed an innovative magnetic method for estimation of soil erosion and redistribution. The new methodology proposed overcomes the limitations and drawbacks of the conventional techniques and complements them.The research team is looking for commercial agreement with technical assistance, services agreement or research cooperation agreement.

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Reference	TOBG20181116001
Public Link	https://een.ec.europa.eu/tools/services/PRO/Profile/Detail/7fd698b8-7028-4008-8b78-1842ade51bcc

Details

Description

The research unit is the leading organisation in Bulgaria in the R&D of environmental magnetism with highly qualified and internationally recognised team. It conducts pioneering research in the application of magnetic methods for evaluation of soil pollution. The institute has broad experience in international collaboration and project implementation.

Land degradation caused by soil erosion is a serious threat because it reduces soil fertility and productivity.

The proposed methodology represents an innovative approach for soil erosion estimates and cost-effective tool in precision agriculture, utilising the well-established regularities of depth changes in soil magnetic properties.Well aerated and drained soils are characterised by an increase in the concentration of strongly magnetic minerals, which cause the so called pedogenic magnetic enhancement. This phenomenon is strongly depth-dependent, which is utilised for estimation of the thickness of the original non-disturbed soil removed from a given location due to the action of erosional factors – water, wind, tillage, combination of factors, etc. One of the advantages of the proposed magnetic methodology with respect to the available tools and methods in erosion studies (137Cs isotopes; magnetic tracers, empirical models such as Revised Universal Soil Loss Equation-RUSLE) is that it is strongly site- and scale-specific; uses the natural soil magnetic signal, which takes into account the effects of mechanical grain size fractionation, and the inherent relationship between soil clay fraction and pedogenic magnetic minerals. In addition, there is no restriction in the temporal integration of the signal,

which is one of the drawbacks of radionuclide methods for erosion estimates.

The new approach is a combination of in situ field measurements of magnetic susceptibility of the area under investigation, and following laboratory magnetic measurements of samples, gathered along depth of non-disturbed natural soil profile and topsoil samples from a defined scheme decided from the evaluation of the field data. The instrumentation for field measurements is compact, mobile and easily connected with positioning systems (GPS). The design of the methodology allows for precise estimation of local (point) soil non-homogeneities, as well as adjustment of lateral discrimination according to the specific needs of the user. The major requirement is to establish close contact between mineral soil surface and the field sensor. On-site field measurements are fast (around 2 min per grid point) and can be performed by minimum two up to several persons as far as the available instruments are carefully inter-calibrated. Special care is taken for the choice of location for sampling natural non-disturbed soil profile. In case of more complicated topography, additional soil cores may be necessary to sample. The following step in the methodology consists of laboratory magnetic measurements of sampled soil profiles and topsoils. The latter is relatively more laborious and time consuming, as far as it includes determination of a number of magnetic characteristics, related to different grain size fractions and mineral components.

The research team is looking for technological cooperation with interested stakeholders, private SMEs, non-governmental organisations and other interested parties under commercial agreements with technical assistance and services agreements or through research cooperation agreements in order to introduce in practice, validate and commercialise the magnetic method for estimation of soil erosion and re-distribution.

Advantages and Innovations

- Fast non-destructive field measurements
- Allows cost-effective high resolution mapping of soil cover
- Sensitive and precise detection of changes in soil thickness caused by erosion
- Does not require lab sample preparation and use of toxic chemicals, which makes it a “green technology”

Stage of Development

Available for demonstration

IPR Status

Secret Know-how

Profile Origin

Private (in-house) research

Keywords

Technology

07001007	Precision agriculture
10002008	Measurement and Detection of Pollution
10002009	Natural Disasters

Market

09005	Agriculture, Forestry, Fishing, Animal Husbandry & Related Products

NACE

M.72.1.9	Other research and experimental development on natural sciences and engineering

Network Contact

Issuing Partner

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Open for EOI : Yes

Dissemination

Relevant Sector Groups

Environment

Client

Type and Size of Organisation Behind the Profile

R&D Institution

Year Established

1950

Already Engaged in Trans-National Cooperation

Yes

Languages Spoken

English
Bulgarian

Client Country

Bulgaria

Partner Sought

Type and Role of Partner Sought

Type of partner sought: interested stakeholders, both SMEs and large companies, non-governmental organisations and research organisations;
- Specific area of activity of the partner: industrial partners or R&D organisation involved in the field of soil erosion and redistribution or innovative magnetic methods for estimation;
- Task to be performed: the institute is looking for commercial agreement with technical assistance, services agreement or research cooperation agreement with in order to introduce in practice, validate and commercialise the magnetic proxy method for assessment of soil erosion.

Type and Size of Partner Sought

SME 11-50,R&D Institution,>500 MNE,251-500,SME 51-250,>500

Type of Partnership Considered

Services agreement
Commercial agreement with technical assistance
Research cooperation agreement

Profile Status: Published

Technology Offer

Innovative greenhouse heating technology for cost effective plant growing

Summary

An SME from Latvia has developed innovative greenhouse heating technology which is cost effective and ensures optimal conditions for plants growing. The technology improves productivity of plants and significantly reduces expenses on heating. The technology can be used by small greenhouse owners as well as large production companies. The SME offers commercial agreement with technical assistance to manufacturers of heating systems for greenhouses to commercialize the technology.

Creation Date	21 November 2018
Last Update	11 December 2018
Expiration Date	12 December 2019
Reference	TOLV20181031001
Public Link	https://een.ec.europa.eu/tools/services/PRO/Profile/Detail/64217e32-e31c-434f-8dc6-991636e2f588

Details

Description

Greenhouses create a sheltered environment for plants by using solar radiation to trap heat. In temperate climates, the sun may do all the heating in greenhouses, but in colder climates additional heat is necessary. For normalization of temperature in greenhouses various sources of heat and systems are used. There are various ways for heating the greenhouses, for example water heating systems, where water is heat carrier, infrared heating systems, where the air is not heated, but surrounding objects, plants and soil, or gas heating systems heating the whole volume of a greenhouse.
The SME from Latvia has developed a heating system which is based on circulating air helping to maintain proper environment for plant growing. This innovative greenhouse heating technology delivers heat directly to the plants and their roots, rather than heating the whole greenhouse. The method saves energy and drastically reduces costs of heating (in some experiments 8-10 times, and, if the plants are under cover, even 12 times). It needs only 30 w/m2 for greenhouse heating. The technology has been tested in real conditions. The technology can be adjusted to the size and design of a greenhouse. It can be integrated in any greenhouse or closed area with enough light.
The SME offers commercial agreement with technical assistance to companies which manufacture heating systems for greenhouses or greenhouse operators.

Advantages and Innovations

The heat is delivered directly to the plants and roots, thus saving energy and reducing costs for heating up to 8-10 times (up to 90%), due to the local heating.
The system fastens the plant growing for 15% and more.
The air moisture is regulated by airflow, draining the plant table after watering.
The heating system can be easy automated for keeping optimal temperature and air moisture.
The technology is cheap, simple and easy to install.

Stage of Development

Available for demonstration

Comments Regarding Stage of Development

Tested in real conditions.

IPR Status

Patents granted

Comment Regarding IPR status

National patent granted. International patent applied.

Profile Origin

Private (in-house) research

Keywords

Technology

004008	Energy efficiency
07001001	Agriculture Machinery / Technology
07001004	Crop Production
07001005	Horticulture
10002013	Clean Production / Green Technologies

Market

05009004	Plant health
09005	Agriculture, Forestry, Fishing, Animal Husbandry & Related Products

NACE

C.32.9.9	Other manufacturing n.e.c.

Network Contact

Issuing Partner

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Open for EOI : Yes

Client

Type and Size of Organisation Behind the Profile

Industry SME <= 10

Year Established

0

Already Engaged in Trans-National Cooperation

No.

Languages Spoken

English
Latvian
Russian

Client Country

Latvia

Partner Sought

Type and Role of Partner Sought

Type of partner sought: companies producing systems for greenhouses or greenhouse operators.

Role of partner sough: implement the technology by producing systems for greenhouses.

Technical assistance: advisory on technical and implementation aspects of the technology.

Type of Partnership Considered

Commercial agreement with technical assistance

Profile Status: Published

Technology Request

Cold end gas condenser design and manufacturing for combustion fumes heat recovery in waste-to-energy plants.

Summary

A Basque SME is looking for partners with knowledge and experience in the design and manufacturing of cold end gas condensers for energy plants. The company requires specifications in order to develop the final formulation of an advanced carbon steel tubes coating to be applied in fume heat recovery installations. A commercial agreement with technical assistance, manufacturing agreement or a technical cooperation to carry out a pre-industrial demonstration is what the Basque SME is looking for.

Creation Date	20 November 2018
Last Update	21 November 2018
Expiration Date	22 November 2019
Reference	TRES20180510001
Public Link	https://een.ec.europa.eu/tools/services/PRO/Profile/Detail/6ed21aa5-3442-4279-8a3f-57b78389069a

Details

Description

A Basque small company that designs and produces tailor-made ceramic & cermet formulations wants to produce a new specific product for combustion fumes heat recovery and condensation technologies. Therefore, it is looking for partners with track background in the designing and putting into operation of cold end gas condensers for energy plants.

Since internal ceramic coating in tubes is key to protect them against corrosion, the Basque SME now requires manufacturing and operation specifications in order to develop the final formulation of an advanced carbon steel tubes coating to be applied in fume heat recovery installations.

After technical studies carried out in the laboratory, the Basque company thinks that they will be able to launch a product with the following major advantages if the right partner is found:
• A cheaper old end flue gas condenser: using coated carbon steel will allow the building of industrial scale well over 20MWh of recovered heat with a short return of Investment periods.
• Recovery of the sensible & latent heat (by condensation) of the fumes, increasing the thermal efficiency of the plant in around 10%.
• Fumes are extremely clean and harmless to the environment because acid rain is produced in the plant

• This acid “New Water” can be easily neutralized with soda and employed in other industrial applications with no need (or reduction) of the use of water from the grid or nature.

Just to give an idea of the water recovery potential, the company estimates that in a Power Plant generating 50MW of electricity, the recovered “acid rain water” can be around 12 – 20 Tmh-1 due to the right application of the internal coating in the tubes.

The company is interested in commercial agreements with technical assistance, manufacturing agreements and technical cooperation agreements.

Technical Specification or Expertise Sought

The company lacks experience and knowledge in the design, manufacturing and operation of condensers so they would like to set up a collaboration agreement with a partner that will provide this knowledge and then define and carry out a validation procedure so they can develop a competitive coating formulation for this applications. Some issues that need to be addressed are:

• If in a condenser all the heat in the form of hot water (around 100 ºC - 212ºF) can be used in other heating needs at the plant (biomass dryers, etc.) or used for District Heating & Cooling.
• If part of the fumes (basically N2 + CO2 + some water) can be used to warm and feed greenhouses
• If these clean & dry exhaust fumes are easier to capture its CO2 than existing alternatives

Stage of Development

Available for demonstration

IPR Status

Secret Know-how

Keywords

Technology

02007003	Ceramic Materials and Powders
04002003	Compression and liquefaction of gases
04002005	Generators, electric engines and power converters
04002006	Heat exchangers

Market

06002001	Oil, gas and coal
06003004	Marine energy
06003009	Biomass and Biofuels

NACE

C.20.5.9	Manufacture of other chemical products n.e.c.

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Open for EOI : Yes

Dissemination

Relevant Sector Groups

Intelligent Energy

Client

Type and Size of Organisation Behind the Profile

Industry SME <= 10

Year Established

2013

Turnover

<1M

Already Engaged in Trans-National Cooperation

Yes

Languages Spoken

English
Spanish

Client Country

Spain

Partner Sought

Type and Role of Partner Sought

The partner sought has to be a company that has experience and knowledge in the design, manufacturing and operation of condensers. Thus, the partner would be able to set up a collaboration with the Basque SME in order to provide this knowledge and then define and carry out a validation procedure a competitive coating formulation so that this application can be developed.

Type and Size of Partner Sought

SME 11-50,>500 MNE,251-500,SME 51-250,>500

Type of Partnership Considered

Manufacturing agreement
Commercial agreement with technical assistance
Technical cooperation agreement