



Surveying

Discover Raw Materials

EU Research

# European scientists research together! EUProject GREENPEG



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## A better primary raw materials process for green transition

The manufacture of devices for green energy production and storage requires an enormous amount of raw materials. While we recycle better and more, it is not enough to cover the surge in demand. Mined raw materials will therefore continue to be an important supply and innovation is thus necessary to improve the technologies applied at different stages of raw material production. Considering that the EU imports 95% of the key raw materials for green energy devices, it is also part of our responsibility to ensure that the production of raw materials outside the EU is done in a more environmentally friendly way.

Before raw materials are produced, experts need to find them. This is mineral exploration, with its first stage called prospecting. The EU is funding research and innovation projects such as GREENPEG to make exploration more effective, even lower in impact, and economically more viable. These international collaborative projects bring together academic institutions, national geological surveys, technical and business consulting companies, exploration companies and not-for-profit associations.

## To find out more about mineral exploration governance and activities in Ireland and the European Union

Within Europe mineral exploration is subject to national and EU level legislation that manages licences and ensures environmental and safety standards are adhered to.

Geological Survey of Ireland:

<https://www.gsi.ie/en-ie/programmes-and-projects/minerals/activities/mineral-exploration/Pages/default.aspx>

<https://www.gsi.ie/en-ie/programmes-and-projects/minerals/activities/mineral-exploration/Pages/FAQs.aspx>

Geoscience Regulation Office of the Department of the Environment, Climate and Communications, Government of Ireland:

<https://www.gov.ie/en/publication/d16da-guidelines-for-mineral-exploration/>

<https://www.gov.ie/en/publication/b45fe-prospecting-licences-common-questions-and-concerns/>

## Exploration in Europe – the EU GREENPEG project at a glance

Important raw materials for green energy production and storage devices such as lithium-ion batteries for electric vehicles can be sourced from pegmatite rocks. Pegmatites are similar in composition to granites, but they are sheets of rock made from large, interlocking crystals often visible to the naked eye. Depending on the nature of the pegmatite, they may be enriched in lithium, high-purity quartz, feldspar, mica, tantalum and tin. In the past they have been mined for quartz, mica and feldspar mainly for the ceramics industry. Today lithium pegmatites provide most of the world's lithium. Pegmatites are relatively common in Europe, but they are small in volume and often buried, so have historically not been easy to find.

GREENPEG aims to develop innovative exploration toolsets with reduced impact on the environment and lower exploration costs also in order to reduce the need for exploration drilling. This approach helps also to make a decision at a very early stage whether to carry out further groundwork or to stop exploration. To ensure the applicability of the toolsets in the EU and around the world, validation will be secured from trials at locations in Norway, Austria and Ireland, testing different landscape, vegetation and climate environments, as well as geological settings.

## GREENPEG project in Ireland

In Ireland we are studying lithium-caesium-tantalum (LCT) pegmatites, which are the primary hard rock lithium source world-wide. Lithium in these pegmatites is hosted within a silicate mineral called spodumene (LiAlSi<sub>2</sub>O<sub>6</sub>). Spodumene is a non-toxic mineral like the other minerals that compose LCT pegmatites. Prospect-level research is being carried out during 2021 and 2022 near Moylisha Hill in Leinster, with soil and stream sampling, surveys by drones and geophysical measurements.

Moylisha Hill was selected for this detailed study because of recent exploration drillings in 2018 and 2021, allowing access to existing boreholes to carry out geophysical measurements of rocks underground and a body of comparison data for testing GREENPEG innovations. The project will also test other no-contact, low-impact techniques, including satellite image analysis over a wider regional area to look at the geology of the area at different scales. Social impact and environmental life cycle assessment studies accompany these geological, geophysical and remote sensing techniques to understand and mitigate any impacts from the exploration toolsets being developed.