Recultivation Strategies for Peat Extraction Fields: A Case Study in Latvia

Dita Kazmere, Maksims Feofilovs, Francesco Romagnoli

Riga Technical University, Institute of Energy Systems and Environment

Contact information:

Azenes street 12/1

Riga, LV1048, Latvia

maksims.feofilovs@rtu.lv

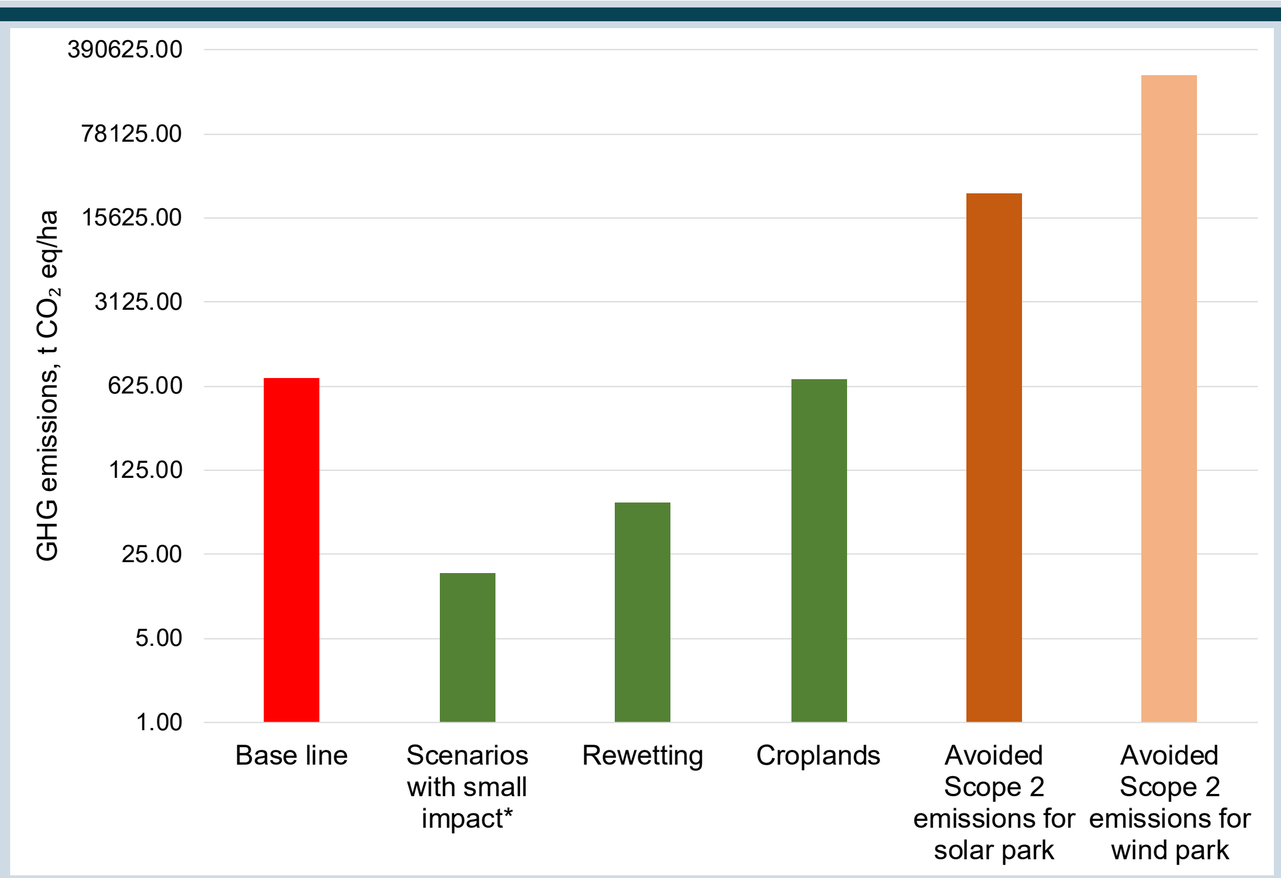

Fig.1 Scenario comparison per 1 ha for the 50-year period including avoided impact from green energy production

* Scenarios with small impact includes afforestation, blueberries, cranberries, meadow, paludicultures, waterbodies

** Croplands include average value from winter wheat, summer wheat and rapeseed

Green energy production and peatland recultivation have an important role in achieving climate neutrality goals.

- Combination of different peatland recultivation strategies can be environmentally and economically beneficial

- Largest emissions are from solar park and wind park construction, but green electricity production compensates for these emissions

Introduction

Globally, peat bogs cover only 3% of the total land area, yet they can accumulate around 23 g C/m²/y of carbon every year. Overall peatlands account for only 12% of the total land area in Europe. Of these 12%, 46% are considered degraded natural areas and 10% are completely lost, i.e. it will be impossible to return to the natural habitat of peatlands. Current emissions from European peatlands are 582 Mt CO_2 eq, which is about 30% of the total global emissions from drained peatlands. Considering the state of peatlands and the move towards climate neutrality, it is necessary to develop recultivation strategies. The main objective is to determine the environmental impacts of different recultivation scenarios.

Methodology

Models in SimaPro are created to determine the impact on the environment. The IPCC2021 GWP100 method (including CO_2 uptake) was used to estimate GHG emissions.

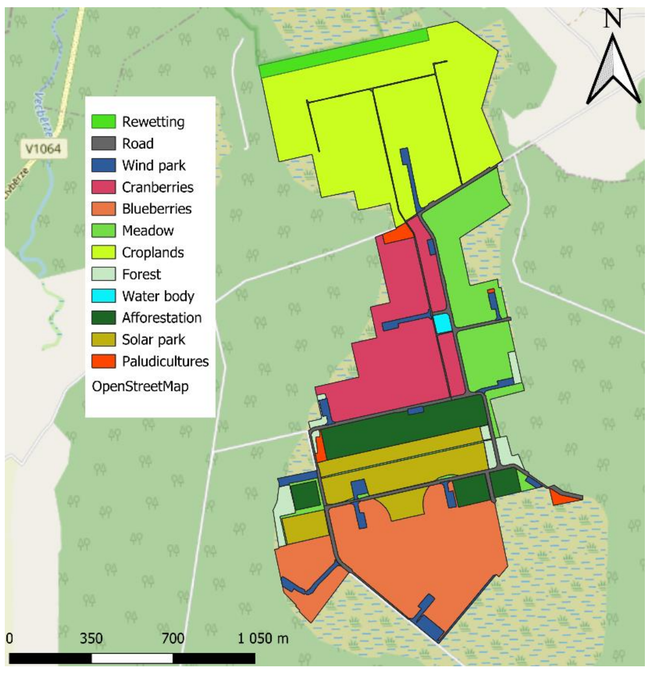

Fig. 2 The recultivation scenario allocated territory

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Results

The case study was divided in two parts emissions per 1 ha and emissions per set territory for every recultivation scenario. In both cases the electricity production has largest avoided emission amount.

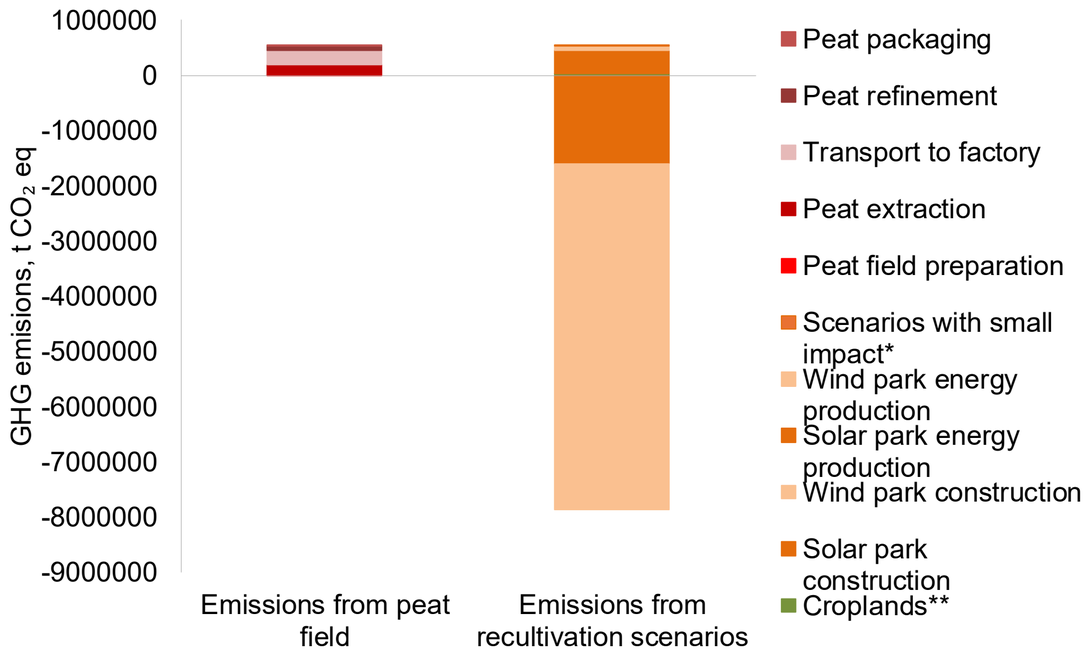

Fig. 3 The comparison between recultivation scenarios and base line including avoided emissions per total land are

* Scenarios with small impact includes afforestation, blueberries, cranberries, meadow, paludicultures, waterbodies and rewetting

** Croplands include average value from winter wheat, summer wheat and rapeseed

Conclusion

- The LCA method, including Scope 1–3 emissions, identified high-impact sustainability scenarios.
- Wind energy cuts GHGs significantly by 2030 (-474 kt CO_2 eq) reaching (-6246 kt CO_2 eq) by 2075.
- Solar power shows net GHG reductions starting 2050 (-706 kt CO_2 eq), reaching -1589 kt CO_2 eq by 2075.
- Switching to on-site renewable energy improves the companies GHG profile.
- Croplands produce the highest emissions, making them least suitable for climate neutrality.