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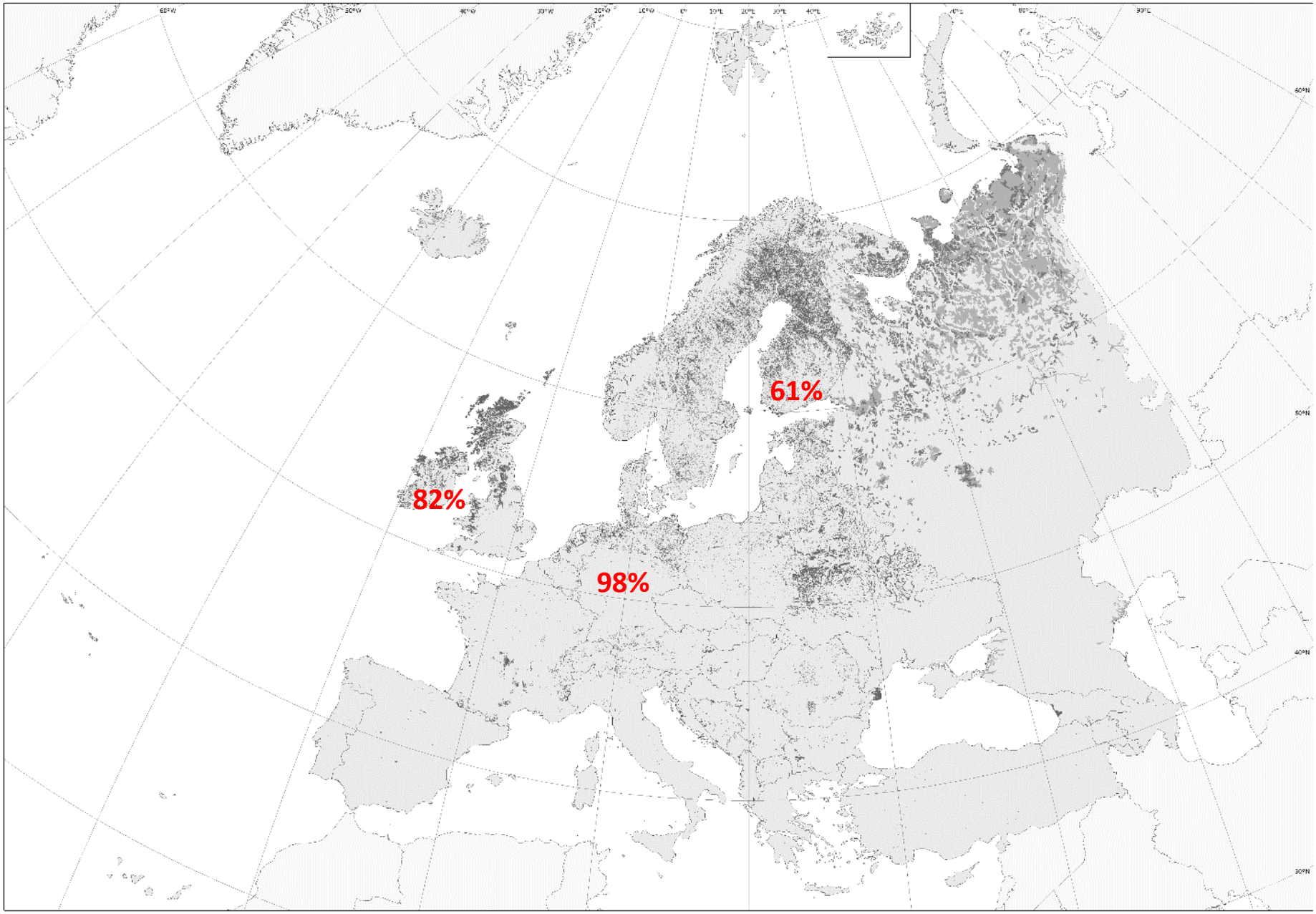
# Carbon farming on peatlands: remuneration and new job profiles

Susanne Abel

Peatlands are long-term carbon stocks

Only 3% of land area, store 2x carbon stock of the world's forest biomass

# Peatlands in all European countries, majority is drained




**% drained of total organic soil area**

Tanneberger et al. (2017)

# Deeply drained grasslands on peatlands in Germany: Emissions of 29 t $CO_2$e/ha*yr (IPCC 2014)

Lower Saxony, Germany

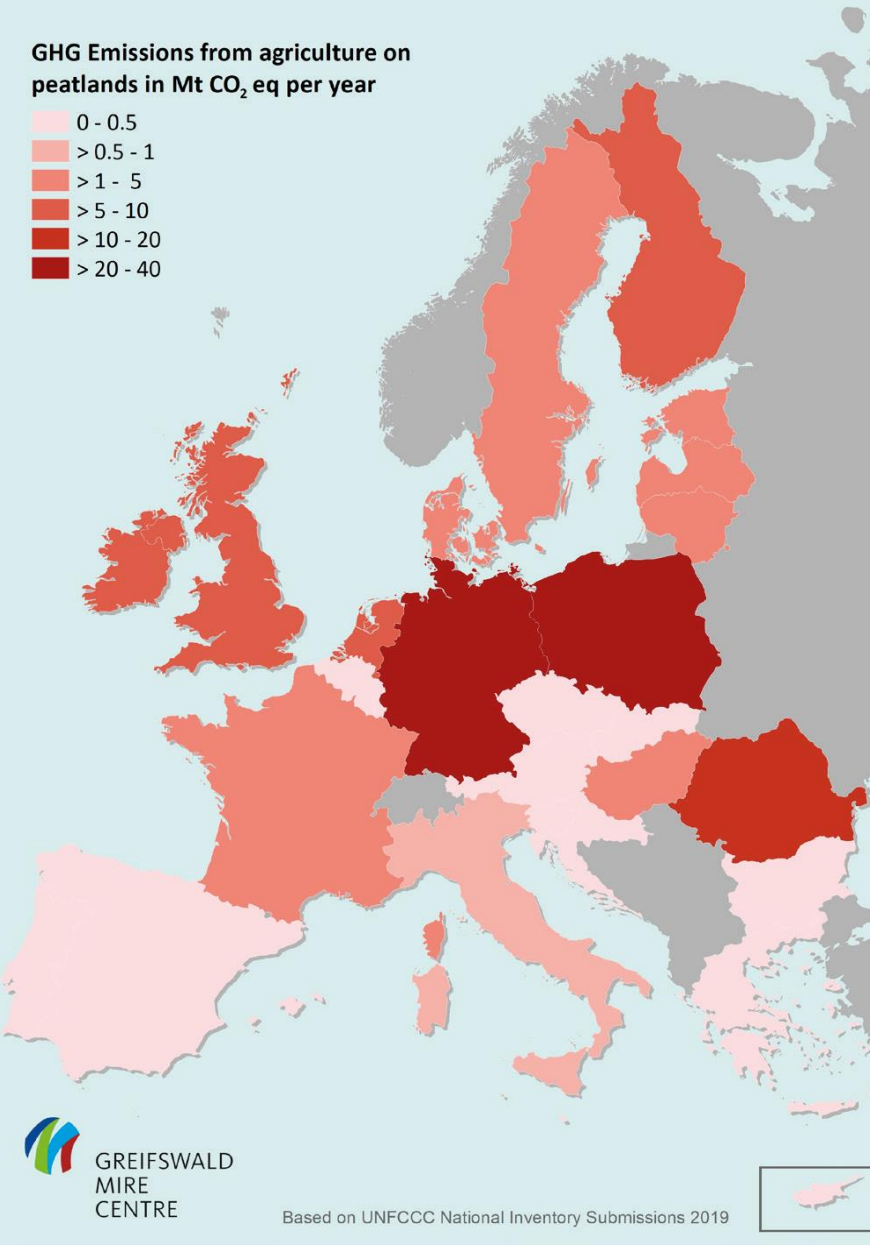


1 kg cheese = 55 kg $CO_2$

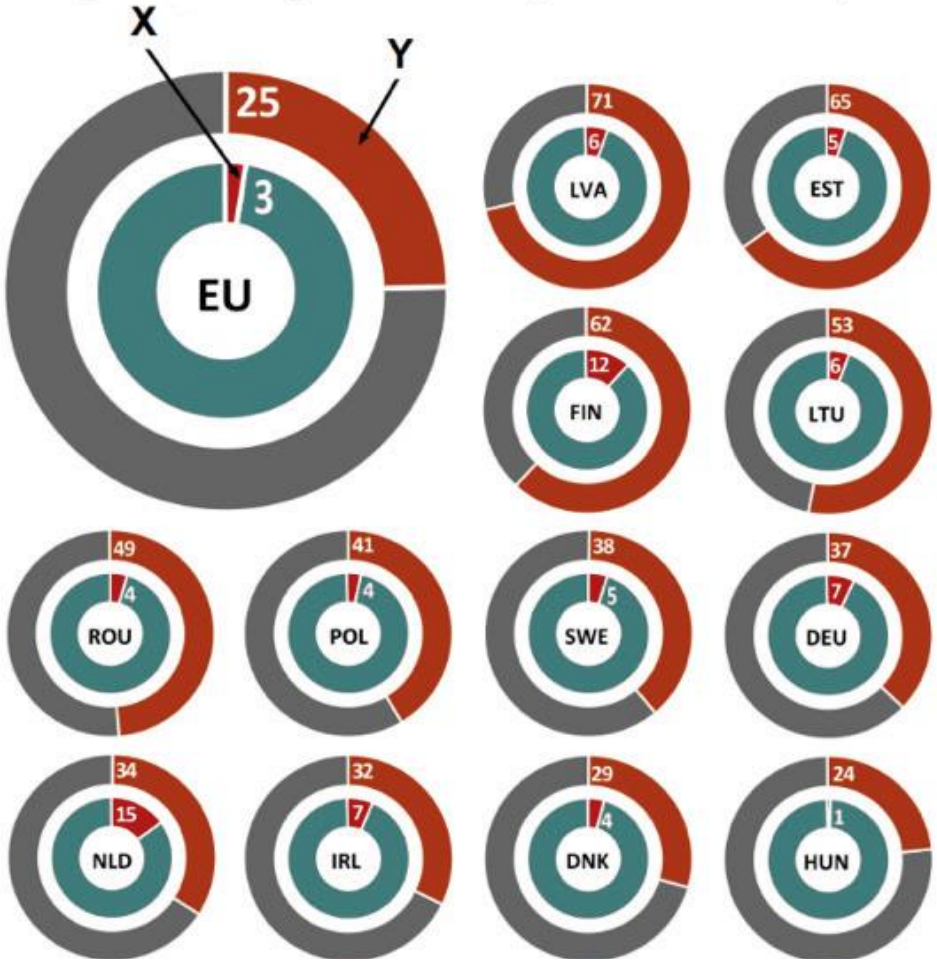
1 L milk = 2.4 l petrol

# Cropland on peat: 37 t $CO_2$e /ha*yr (EF, IPCC 2014) = more C loss than in biomass of produced potatoes


Bavaria




Small area (3%) causes high emissions (25% of agricultural land use emissions)




5 % of the EU‘s annual GHG emissions

Peatlands = 220 Mt $CO_2$e

**-> high emission reduction possible**

# **Rewetting of peatlands reduces $CO_2$ emissions**

Avoided emissions from peatlands offer immediate, significant, and quantifiable climate benefits

NE Germany

# Paradigm shift for peatland use

**Alternative income options** needed

- Paludiculture: wetland crops + value chains
- Rewarding of emission reduction (e.g. public payment or appropriate credit schemes)

**Adjustments** of CAP framework

-> many paludicultures currently not eligible for CAP payments

# Examples for new value chains

- Building and insulation material
- Fibres for paper and biodegradable dishes
- Fuel
- Growing media for horticulture (phasing out peat use)

**Products can be climate friendly in 3 ways:**

a) Climate smart agriculture
b) Renewables replacing fossils (bioeconomy)
c) Long term carbon storage

# Current rewarding options

Agri-Environmental Climate Scheme (AES)

- Low-intensity grassland – but mostly no rise in water level
- “Moorschonende Stauhaltung” (fixed weir) of the federal state Brandenburg/Germany with 387 € per ha*yr

**Not result-based -> evaluation of real emission reduction is necessary**

# New job: Peatland Carbon Farmer!

**German: „Moor-Klimawirt“**

Climate protection is achieved by reducing GHG emissions by raising water levels or the maintenance of high water levels

Examples of such management are:

- Wet meadow and wet pasture management
- Cultivation of paludiculture crops
- Complete retirement at high water levels

# Example I: Fen biomass used in a heating plant (DEU, Malchin)

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- Biomass (sedges, wet meadows) from 400 ha of rewetted fen
- Heating plant (800 kW) feeds in local heat network of Malchin
- Emission reduction via avoidance (~10 t $CO_2$e/ha*yr) and substitution of gas (~3 t $CO_2$/ha*yr)
- Competition with fossil fuels, without rewarding the climate benefits by climate smart agriculture

# Example II: Peat moss cultivation on 17 ha in NW Germany

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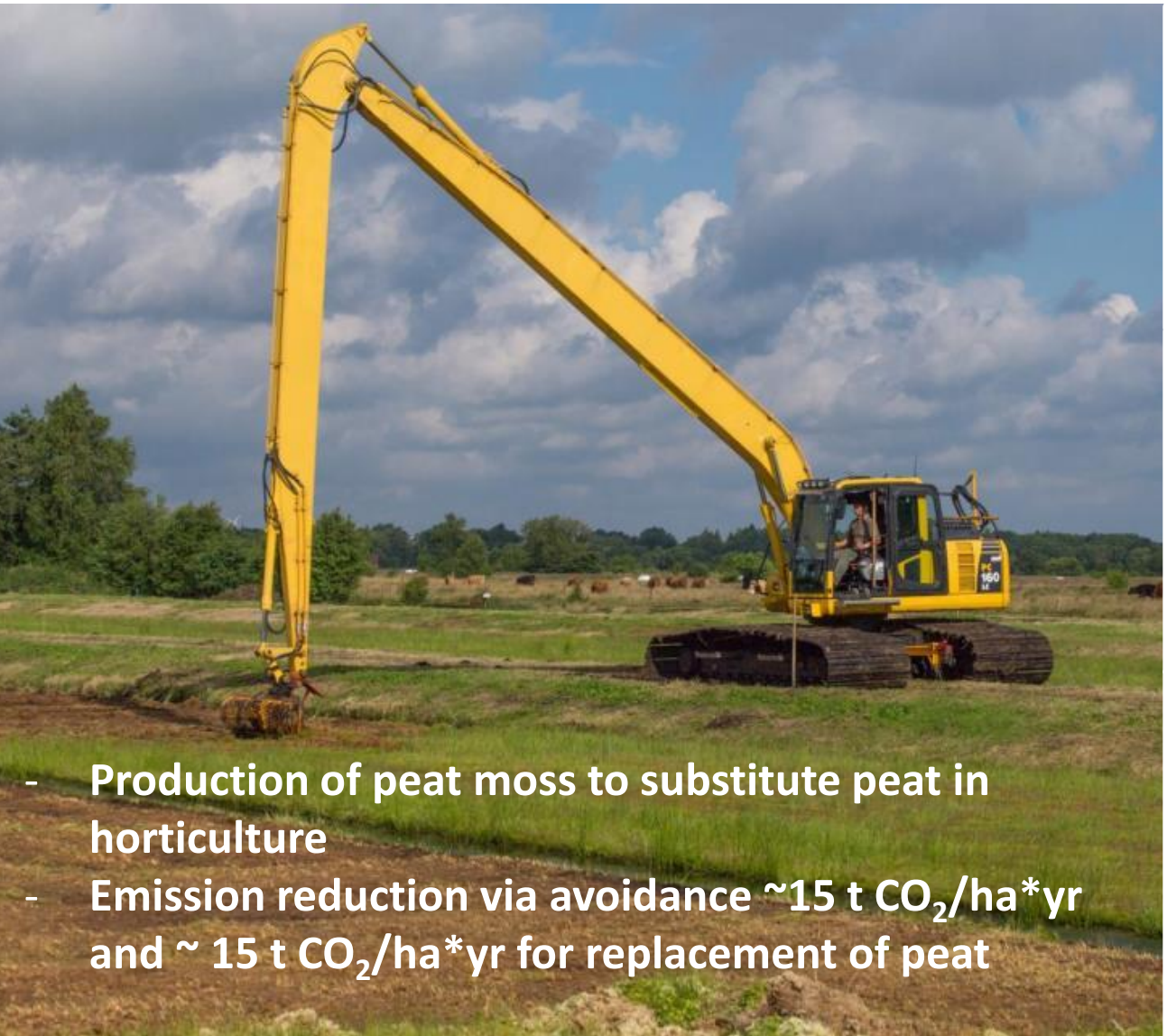

- **Production of peat moss to substitute peat in horticulture**
- **Emission reduction via avoidance ~15 t $CO_2$/ha*yr and ~ 15 t $CO_2$/ha*yr for replacement of peat**


# Challenges for farmers

- Break with **traditions**
- **Conversion** of the farm orientation
- **Lack of experience** with paludiculture & lack of demonstration farms
- Missing value chains
- Conflicts with **nature conservation**
- **Conflicts with current CAP**

- **Area access** (fragmented ownership structure, impact on neighbouring sites)

  ➔ Thinking in hydrological units
  ➔ Land consolidation
  ➔ Regional cooperation (e.g. water boards, farmer & landscape care associations)

# Paludiculture research

- Management practices (pilot farms)
- GHG emissions effects
- Area-based monitoring and evaluation (proxies for MRV etc.; incl. non-use options)

# Paludiculture and carbon farming are **win-win-options**

- ✓ **Agriculture:** new income, soil protection climate adaptation
- ✓ **Society:** rural development, recreation, tourism, identity
- ✓ **Economy:** substitution of fossil resources, bioeconomy
- ✓ **Environment:** Climate, water and biodiversity protection

**PEATLANDS IN THE EU**

**COMMON AGRICULTURE POLICY (CAP) AFTER 2020**

Position Paper - (Version 4.8)

KEY TARGET

To facilitate the new environmental ambitions of the Post-2020 Common Agricultural Policy (CAP) and to create coherence between agricultural and climate policies, CAP must safeguard and stimulate the preservation of carbon-rich soils through protection of peatlands[1].

PRIMARY GOALS

1 Guaranteed eligibility of farmed wet peatlands for CAP payments.

2 Phasing out CAP payments for drained peatlands.

3 Establishment of results-based agricultural payment schemes remunerating ecosystem service provision as low greenhouse gas emissions from peatlands.

PEATLAND UTILISATION: AN INTERPLAY OF AGRICULTURAL AND CLIMATE POLICIES

Peat forming lands are particularly rich in organic matter. Peat accumulates in areas where the decomposition of plants is slowed due to wet conditions, which results in a large store of carbon accumulated over thousands of years. **Fully functional, healthy peatlands are the most space efficient long-term carbon store and sink in our planet's biosphere** (see figures 7 & 8). Peatlands have been drained for agriculture, forestry and peat extraction.

The negative consequences of this use is becoming increasingly obvious (see figures 1 & 2). Drainage allows oxygen to enter the soil, leading to microbial decomposition of the peat and thereby breakdown of the stored carbon leading to emission of substantial amounts of $CO_2$ and $N_2O$. Further negative consequences of drainage are a reduction in water quality through the discharge of nutrients to ground and surface water and land subsidence (1-2 cm yearly). This results in increasing drainage costs, higher flooding risks, reduced water quality and - ultimately - loss of productive land.

*Figure 2: Drained and degraded peatlands emit up to 30 tonnes of $CO_2$ per hectare per year. (Photo: Ireland, courtesy of Care Peat EU Interreg project)*

PEATLANDS AND ORGANIC SOILS IN THE EUROPEAN UNION

Peatlands occur in almost all EU Member States, with a concentration in north-western, Nordic and eastern European countries[2] (see figure 3).

**Globally the EU is the second largest emitter** of greenhouse gases (GHG) from drained peatlands (220 Mt $CO_2$eq/year = 15% of total global peatland emissions[3]). This is equivalent to circa 5% of the official EU greenhouse gas emissions total of 4,483 Mt $CO_2$eq/year in 2017[4]. Peatland emissions are reported by EU countries in the National Inventory Submissions to UNFCCC but not yet accounted[16].

**The largest peatland emitters in the EU** are Germany, Finland, United Kingdom, Poland, Ireland, Romania, Sweden, Latvia, Lithuania, and the Netherlands. In most of these countries, drained peatlands contribute to more than 25 % of total emissions from agriculture and agricultural land use (see figure 4)

**99% of EU peatland emissions** are caused by **16 of the 28 EU Member States**.

*Figure 1: Drainage-based agriculture such as dairy farming on peatlands is widespread across the EU. It is subsidised by CAP payments but causing huge environmental losses and damage. (Photo: Denmark, by Hans Joosten).*

*Figure 3: Map showing peatland distribution across Europe indicating proportions of peatlands of the total country area.[5]*

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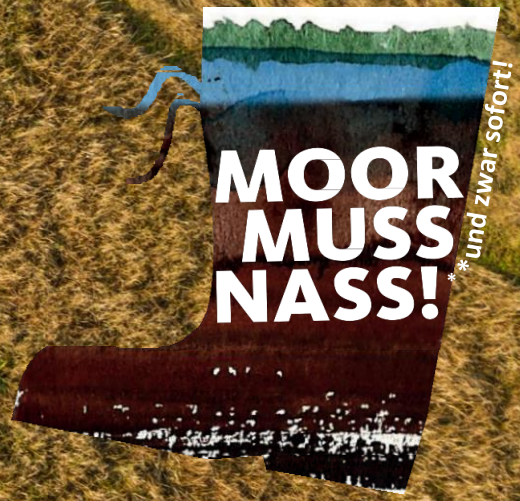


# Thank you for your attention!

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