Biomass for heat supply

Biomass from peatland can be used as renewable energy to supply local communities with heat. Since 2014, about 2,000 t of hay bales (Sedges, Reed canary grass) from rewetted fields are used to produce 4000 MWh heat per year which is provided to about 100 households and a number of public buildings in the town of Malchin. By substituting natural gas the use of biomass mitigate about 1000 t of CO₂ annually. Additionally, the utilisation of biomass for landscape management sustains the agricultural use of 350 ha rewetted peatland.

To define additional locations for local heat delivery through biomass from rewetted peatlands we have (1) specified the heat demand of several locations, (2) identified potential sites for the production of paludiculture biomass and (3) brought relevant stakeholders together.

- (1) For the heat demand the peak load and the total annual heat demand are important. Additionally, the density of households and the availability of an heating grid is of relevance. With these parameters the feasibility (amount of MHW per year for profitability) and site demand (hectare of rewetted peatland for biomass production) were estimated.

- (2) The amount of potential production sites for the biomass was estimated within a radius of 10 and 20 km. The agricultural used peatlands are categorized into sites (a) without restriction by nature conservation, (b) with restrictions by nature conservation and (c) within the agri-environmental scheme "conservation management grassland".

These three categories are chosen because:

- No utilisation of biomass from drained peatlands. The emission of drained sites is larger than the mitigation of substituting fossil fuels.
- Agricultural sites without restrictions could also be used to cultivate paludiculture crops for material utilisation (energy utilisation would also be possible). The site are available for paludiculture biomass production in at least 5-10 years, as water level have to be raised.
- On agricultural sites with restrictions only wet meadow paludiculture can be realized. The biomass could be used for energy utilisation. The sites are already wet but water level can still be optimized. The site availability is maybe less than 5 years.
- Sites of the agri-environmental scheme "conservation management grassland" are already in extensive use. Nevertheless assessments of further water level raise are necessary but fortunately only marginal adjustments are needed. Utilisation of biomass in short-term should be possible. With respect to the local biodiversity none of these sites should be grazed.

Conclusion

In the case of implementing additional heating plants, the substitution of natural gas would result in an emission reduction of 125 t CO₂ eq per annum. If 30% of the heating demand of a heating plant could be achieved by converting (drainage based) grassland to wet meadow. This option would be realizable short-term.