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Annual net ecosystem exchange of Carbon dioxide
from Danish fen peatland used for growing reed canary grass
and spring barley

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The sustainability criteria of EU Directive 2009/28/EC require that calculation of greenhouse gas (GHG) emission savings from bioenergy production. The main objective of the project is to estimate net emissions of GHG from fen peat soil types under current annual crop cultivation practice and perennial energy crops cultivation. We measured CO₂ balance on riparian fen peatland used for growing reed canary grass (RCG) and Spring Barley (SB) for one year with transparent dynamic closed system chambers with different level of light intensity. The flux measured with chamber was divided into light dependent part as gross photosynthesis (GP) and light independent part as ecosystem respiration (RE). The result shows a strong seasonal pattern of both GP and RE. RE was modeled using temperature and ratio vegetation index (RVI) and GP was modeled using photosynthetically active radiation (PAR) and RVI including temperature sensitivity of photosynthesis. Both uptake and emissions of CO₂ was higher from RCG cultivation but net ecosystem exchange was near to zero in both cropping system.