Operational strategy, economic and environmental performance of sludge treatment reed bed systems - based on 28 years of experience - DTU Orbit (28/07/2019)

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Sludge treatment reed bed (STRB) systems have been used for dewatering and mineralisation of sludge in Europe since 1988. STRB systems provide substantial environmental, economic, and operational benefits compared to mechanical sludge dewatering solutions such as belt presses and centrifuges. They require less energy, no chemicals, reduce the sludge volume and produce bio solids with dry solid contents up to 20-40% under Danish climate conditions, depending on the sludge quality. Experience has shown that sludge treated in STRBs represents a high quality product with a low content of pathogens and hazardous organic compounds, qualities that make it suitable for recycling on agricultural land. The upfront capital cost for STRBs are often higher compared to mechanical dewatering devices. However, the operational expenses (OPEX) (including energy, chemicals, bio solid handling) are significantly lower compared to conventional mechanical dewatering devices, delivering an economic break-even of about 3-5 years. This paper provides an overview of the operation and maintenance costs and environmental benefits of a typical STRB based on the experiences gained from the operation of a large number of STRBs with yearly treatment capacities between 100 and 3,000 tonnes of dry solid up to approximately 250,000 PE in Denmark and Europe.

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