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<b>Title</b>	<b>Experience with source separating systems for wastewater in Scandinavia</b>
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### Experience with source separating systems for wastewater in Scandinavia

In Scandinavia, source separating wastewater systems have been successfully developed with an emphasis on urine diverting systems in Sweden and blackwater collection/aerobic treatment in Norway. Urine diverting systems employ specially designed toilets for separate collection of urine and faeces with little or no use of flush-water. The excreta are hygienised by storage (in the case of urine) or composting/storage (in the case of faeces). Blackwater consists of mixed urine, faeces and some flush-water collected using water saving toilets, e.g., vacuum toilets. The collected blackwater may be hygienised by co-composting at thermophilic temperatures with source separated organic household waste. Whichever system is employed, source separated excreta represent a valuable, nutrient rich resource for crop fertilisation; e.g., blackwater contains ca. 90 % of the nitrogen and ca. 80 % of the phosphorous in household wastewater.

The source separated greywater fraction consists of wash water from the kitchen, shower and bathroom. It can be treated onsite before being safely discharged to surface water sources or, if desired, used for ground water recharge or irrigation. In Norway, biological filters based on light weight aggregates have been successfully used to reduce pathogen and nutrient loads in greywater to below recognised international standards.

This paper describes source separating wastewater systems and their implementation from the Scandinavian perspective. Material is collected by reviewing all major ecosan systems in Scandinavia each serving 40 to 50 households or more. The systems are evaluated from a technical, social, economical and legal perspective and improvements and research needs suggested. The investigation concludes that the systems are viable and that the major problems often can be solved by simple means. When comparing costs to centralized end of pipe systems the ecosan systems are often competitive. Some ecosan system are close to the prototype stage it is therefore assumed that industrial optimization of ecosan systems will increase future competitiveness.