

## **Anammox brings WWTP closer to energy autarky due to increased biogas production and reduced aeration energy for N-removal**

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**Abstract** Fifty years ago when only BOD was removed at municipal WWTP primary clarifier were designed with 2-3 hours hydraulic retention time (HRT). This changed with the introduction of nitrogen removal in activated sludge treatment that needed more BOD for denitrification. The HRT of primary clarification was reduced to less than one hour for dry weather flow with the consequence that secondary sludge had to be separately thickened and biogas production was reduced. Only recently, the ammonia rich digester liquid (15-20% of the inlet ammonia load) can be treated with the very economic autotrophic nitrification/anammox process requiring half of the aeration energy and no organic carbon source compared to nitrification and heterotrophic denitrification. With the introduction of this new innovative digester liquid treatment the situation reverts, allowing to increase HRT of the primary clarifier to improve biogas production and reduce aeration energy for BOD removal and nitrification at similar overall N-removal.