

AnitaMox energy requirements compared to that of Wastewater treatment





Chitra S Raju

Process Manager Billund Vand og Energi





BBR process lines









Opinions in BVE about AnitaMox





A little history of AnitaMox at BVE

- Two AnitaMox tanks
- AM1 140 m³ (built 2013)
- AM2 500 m³ (built 2015)
- Since 2018
 - AM1 functions as a guard tank where it removes COD and inhibitors
 - Seeded with wastewater sludge
 - Expect mostly nitrifiers
 - AM2 has Anammox
 - Both have plastic carriers
- AM2 has been seeded three times, started once and re-started three times
- The latest re-start was without seeding material





Ammonia removal in AnitaMox system





Ammonia removal in GRA

Ammonia effluent: 8,9 kg/d TN effluent: 41 kg/d Ammonia influent : 329 kg/d TN influent: 577 kg/d Sludge to energy section

GRA Removal efficiency

- Ammonia: 97%
- TN: 93%
- Energy consumption

:	Scenarios	Energy Consumption, kWh/d	Energy consumption, kWh/kg NH4	Energy consumption, kWh/kg TN	Description of Scenarios
	1	6652	20,2	11,5	Energy usage of entire GRA, with energy used by Hydrotech filter to remove SS is included and therefore includes energy used to remove TN as this is included in the SS
	2	6456	19,6	11,2	Energy usage of entire GRA to remove NH4, thus without energy used by Hydrotech filter
	3	2025	6,2	3,5	Aeration tank, total aeration used to remove COD and N
	4	668	2,0	1,2	Only nitrification



What now?

Energy comparision

- Depending on what you compare with the conclusion changes wildly
- If you compare with entire energy usage of GRA then AM1+AM2 is a clear winner
- AM1 +AM2 removes both COD and NH4, so if we have to compare it to the GRA then we compare it to entire aeration.
 - They are amost equal
- AM2 removes NH4, so we compare its energy usage to NH4 removal in GRA.
 - They are almost equal
 - But AM2 cannot function without the removal of COD in the first place
- AnitaMox is using more energy that expected because of COD removal.

Action to be taken,

- N2O considerations
- Investigate energy optimisation
- Remove AM1 as guard process









Questions?