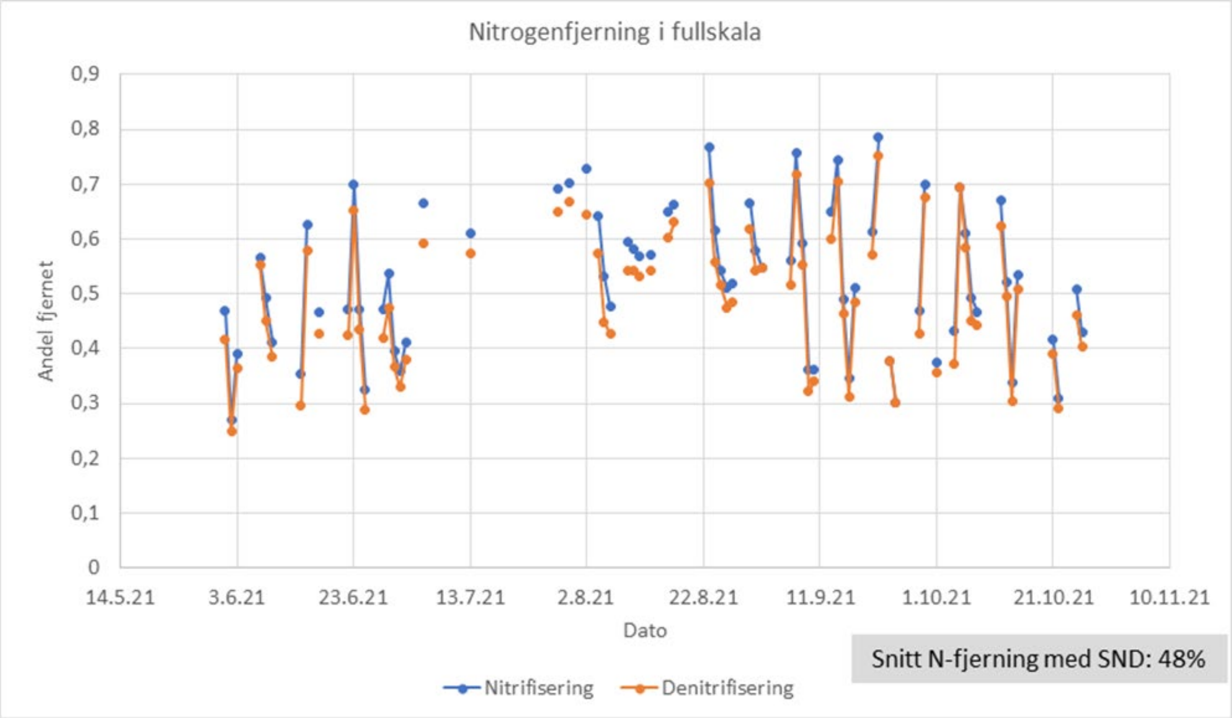
# Kommende nitrogenfjerningskrav –

# Hvilke tilnærming gjør Hias?

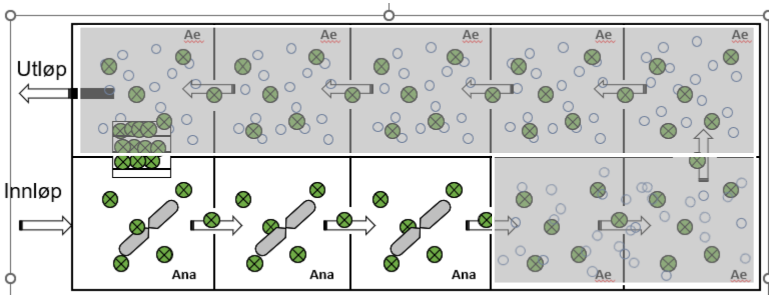
https://www.youtube.com/watch?v=-vVTlqUCqag&t=262s

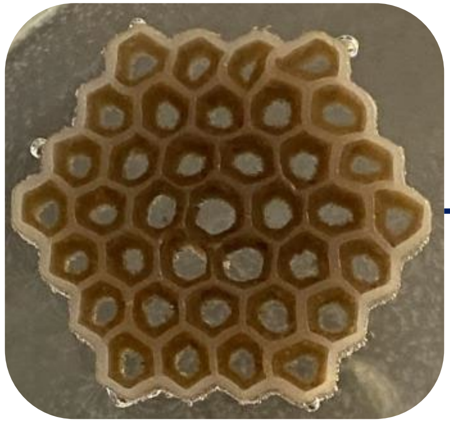
# Hvordan kombinere fosfor og nitrogenfjerning i Hias-prosessen?

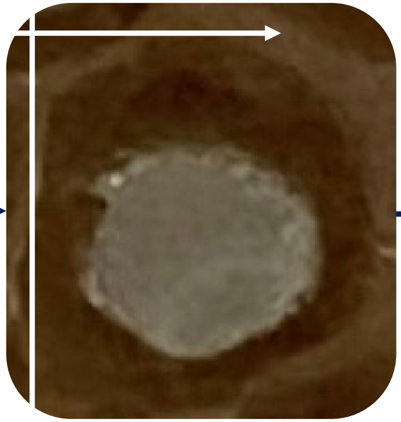
Sammen om et bedre miljø

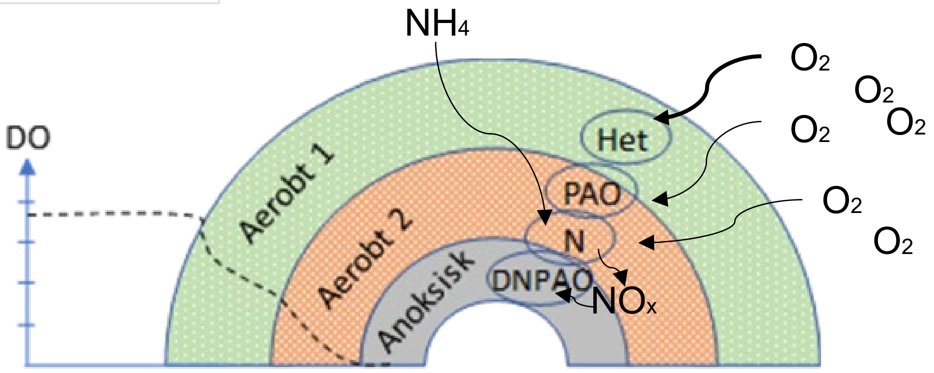



## Hias demonstrasjonslinje: Nitrogen-fjerning via SND



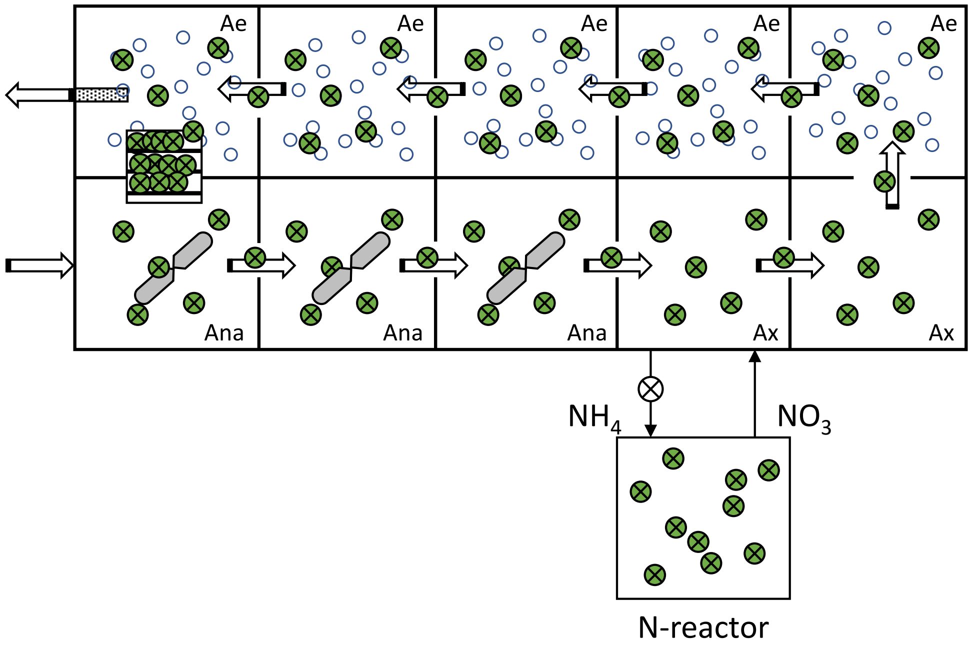



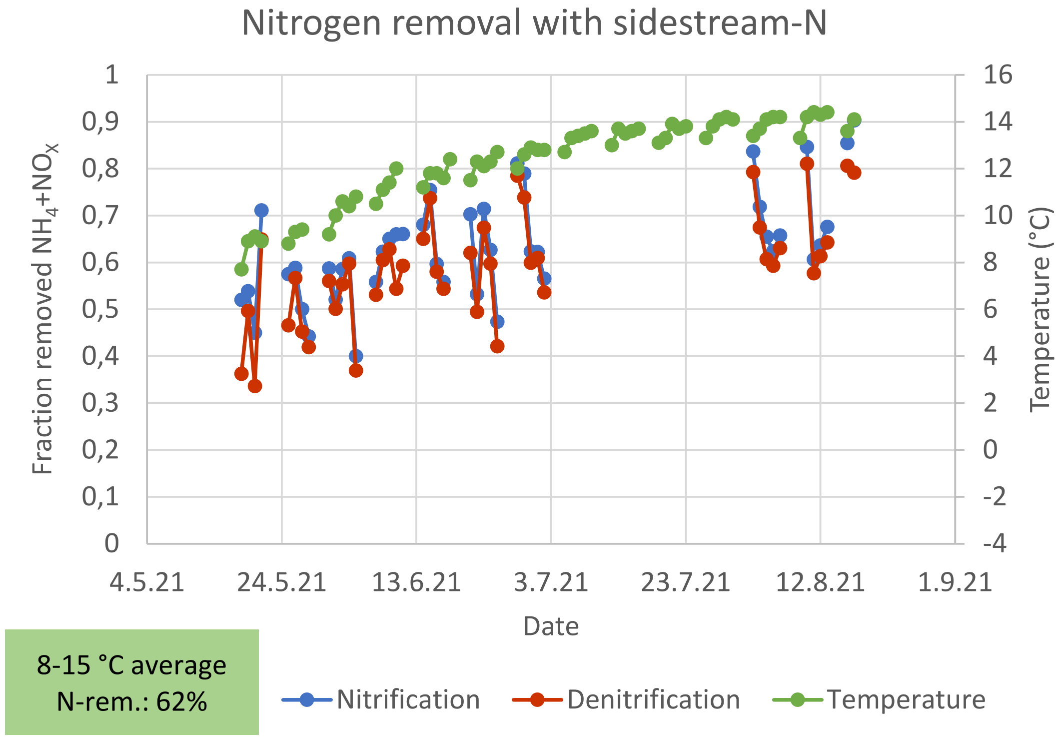




# INCREASING THE N-REMOVAL

## Pilot

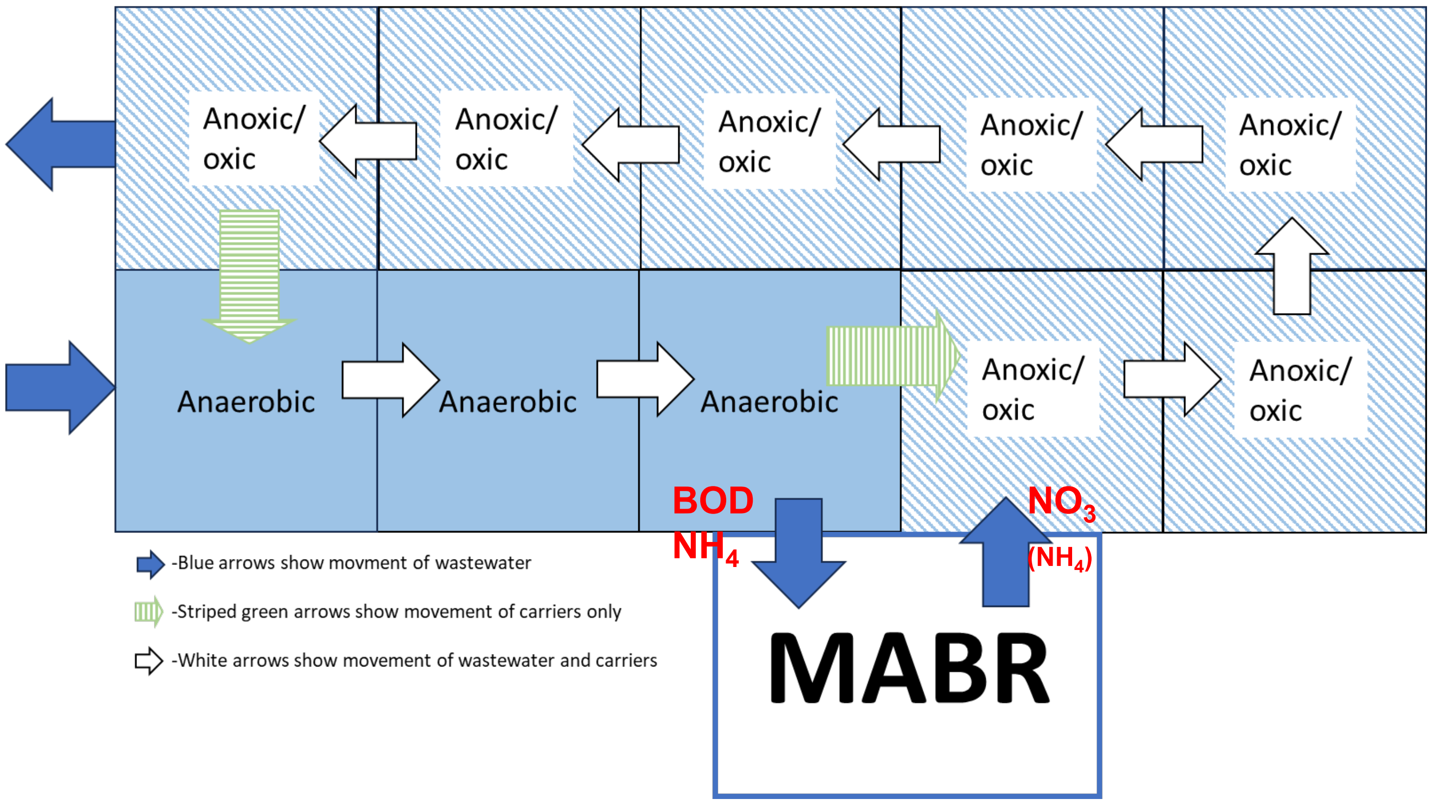



8-15 °C average
N-rem.: 62%

# Hias-prosessen kombinert med MABR sidereaktor

Sammen om et bedre miljø




## Målsetning

- **Møte kommende nitrogenkrav uten behov for innkjøpt karbonkilde**
- **Holde oss innenfor eksisterende bygningsmasser**
- **Redusere energibehov i den biologisk renseprosessen sammenliknet med dagen forbruk.**

**MABR:**

- SND og nitrifikasjon.
- Denitrifikasjon med restkarbon fra Hias prosessen

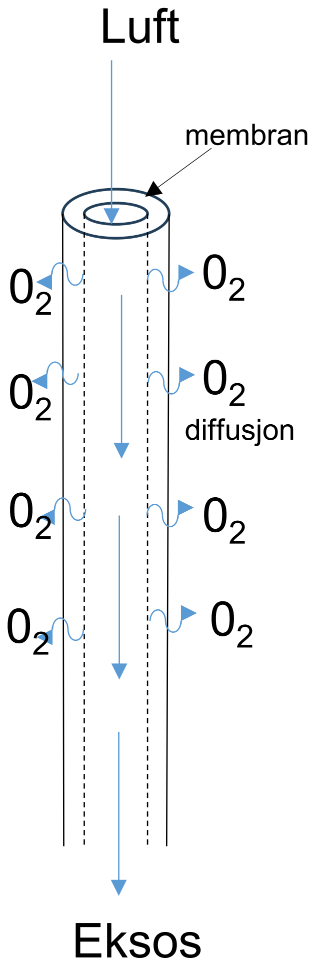
**Hias prosessen:**

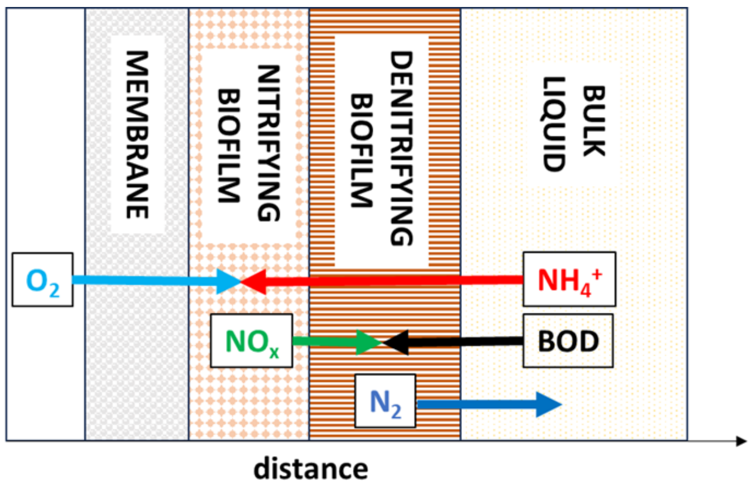
- Anoksisk fosforopptak kombinert med SNDP med anaerobt lagret karbon

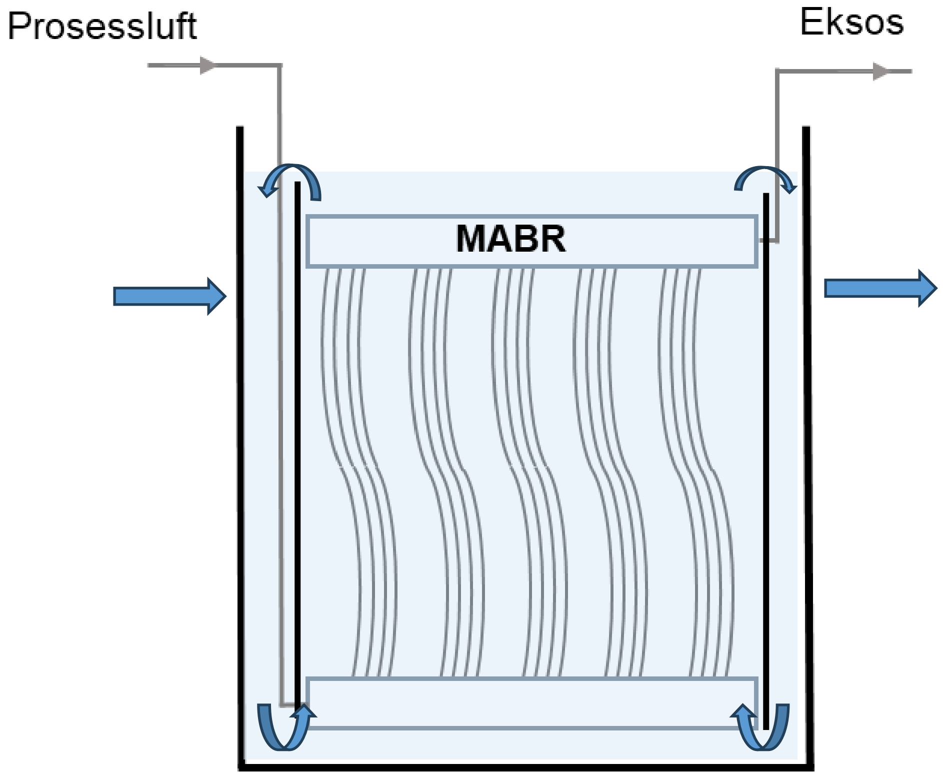
# MABR- Membrane aerated biofilm reactor

Hias

Sammen om et bedre miljø

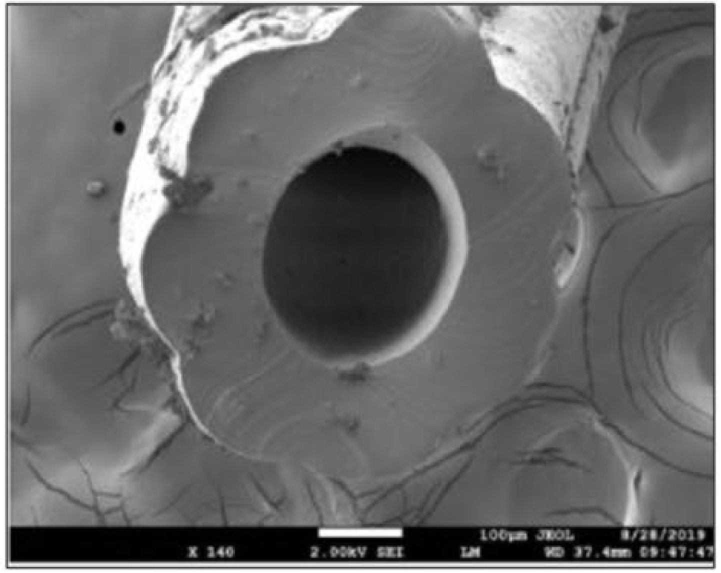



- Effektiv tilførsel av $0_2$
- Høy nitrifikasjonsrate
- God SND funksjon
- Lavt arealbehov

# OxyMem MABR Up Close



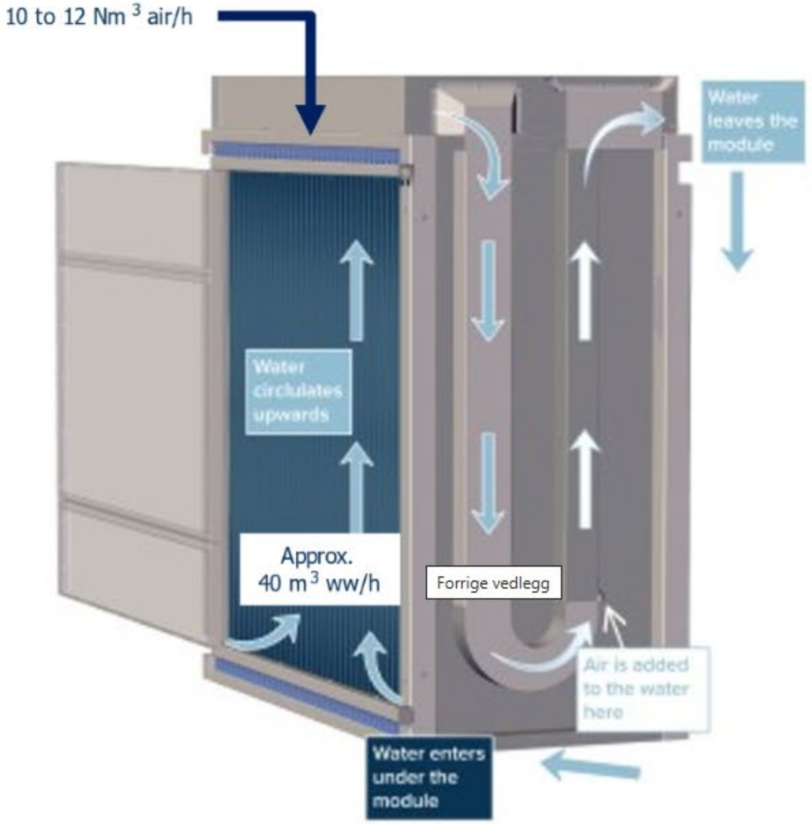

***Video: Biofilm in motion***

OXYMEM
a DuPont brand

Hias

Sammen om et bedre miljø

# MABR mixing: Integrated airlift




OXYMEM
a DuPont brand

Hias

Sammen om et bedre miljø

# Fra pilot til fullskala

Hias
Sammen om et bedre miljø

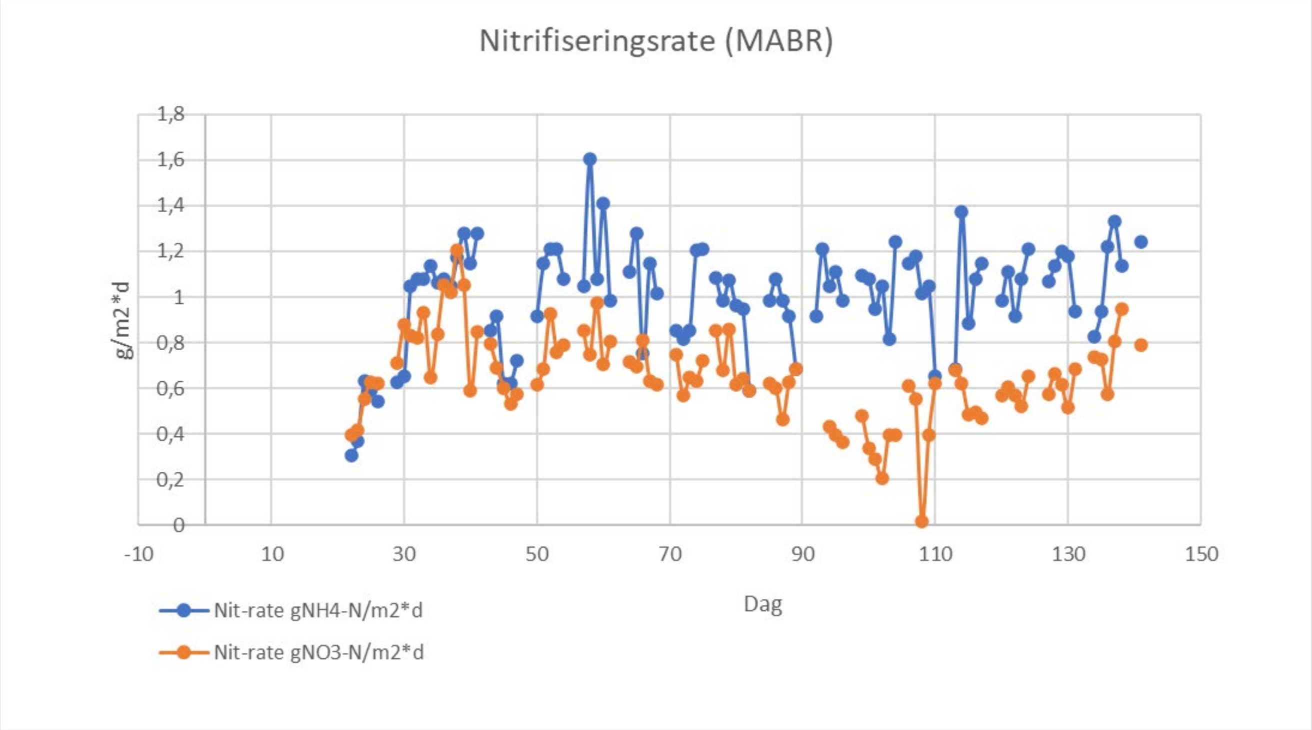
Prototyp ~10.000 PE (mai 2025)

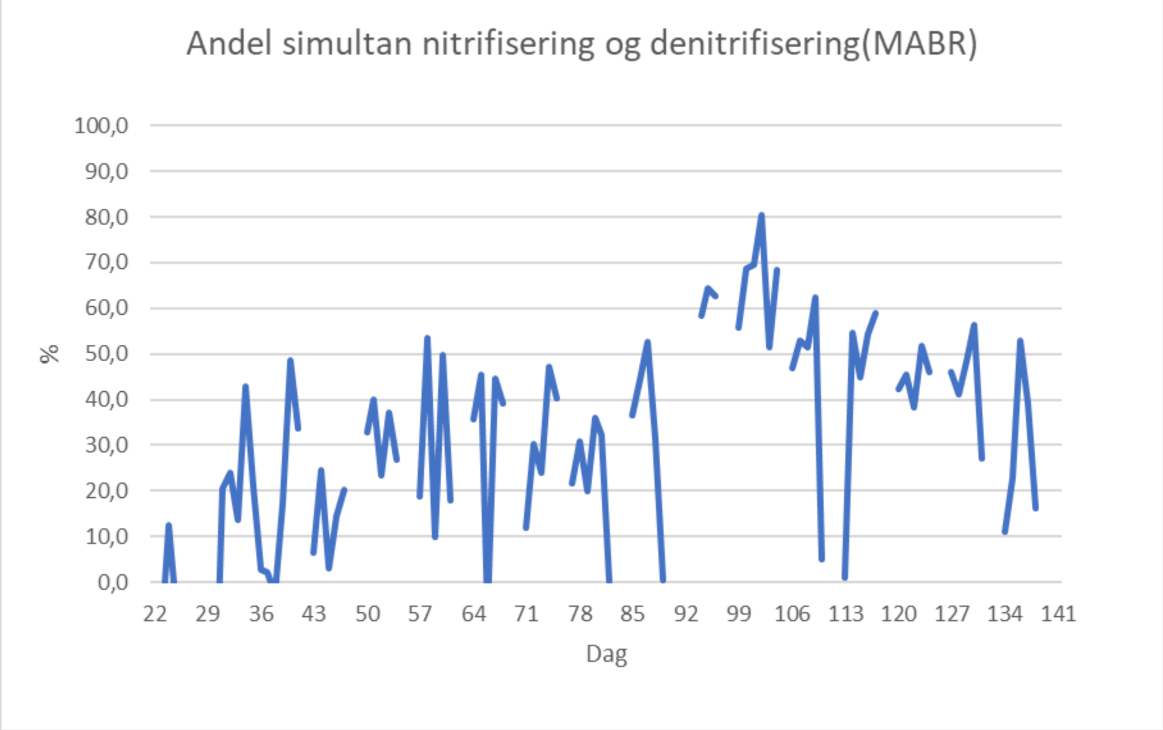
Pilot ~150 PE (2024)

3 stk. (2027, nov 2030)

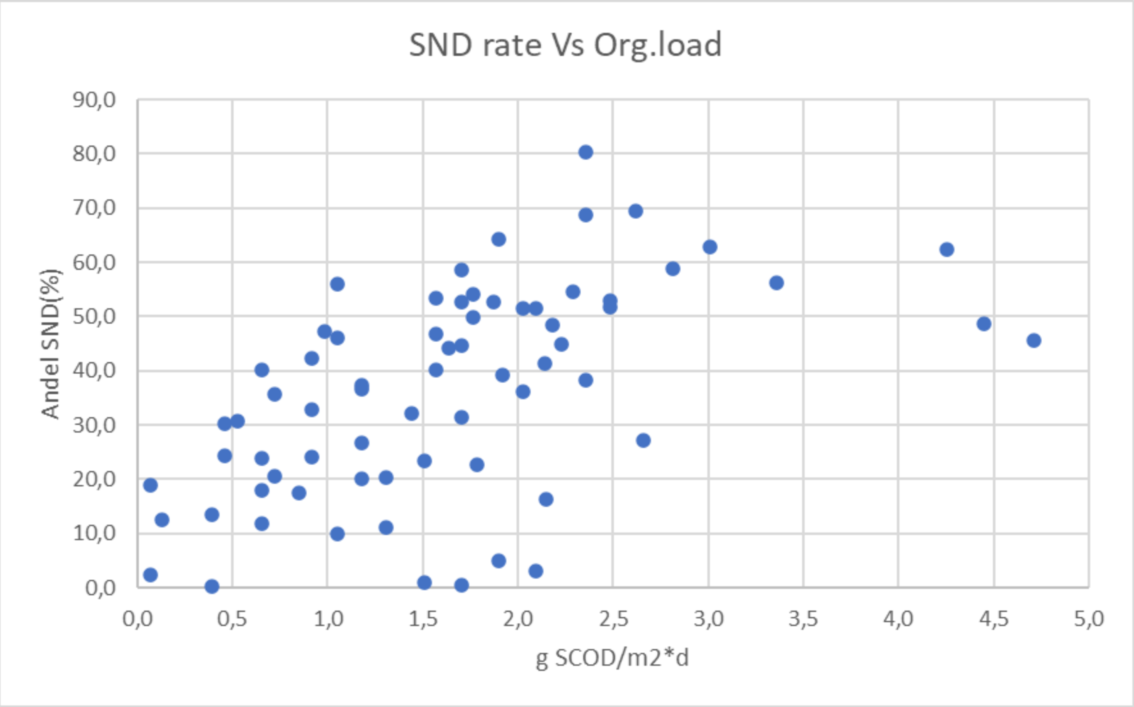
# Resultater MABR så langt

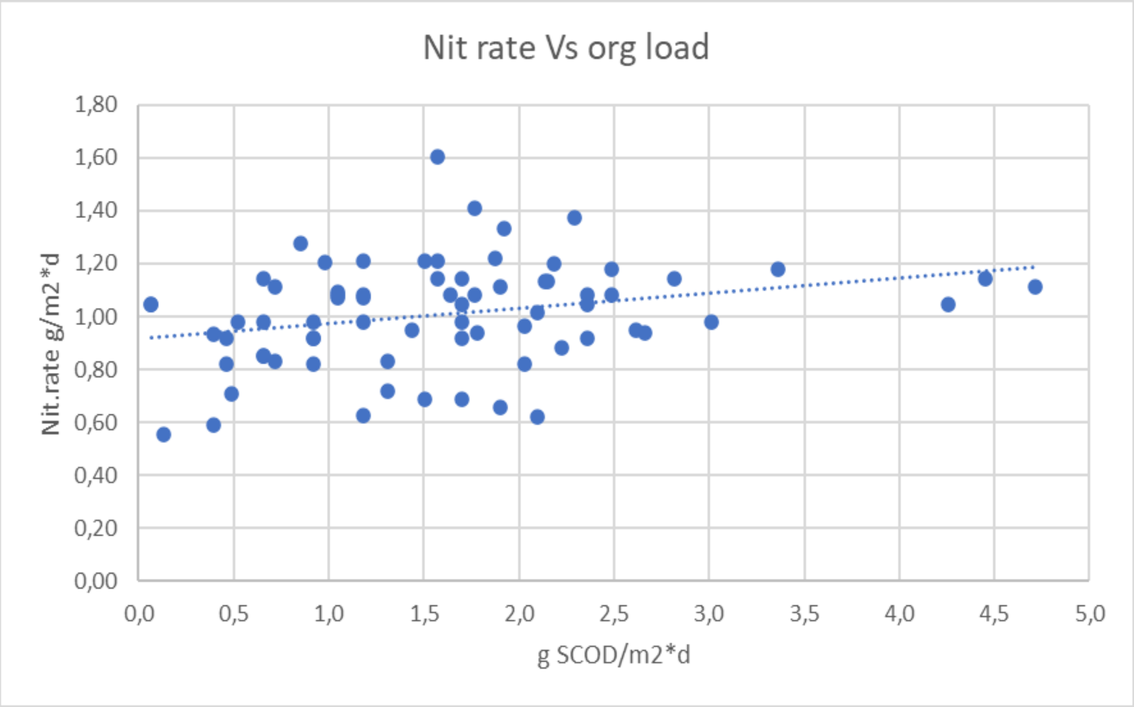
Hias
Sammen om et bedre miljø

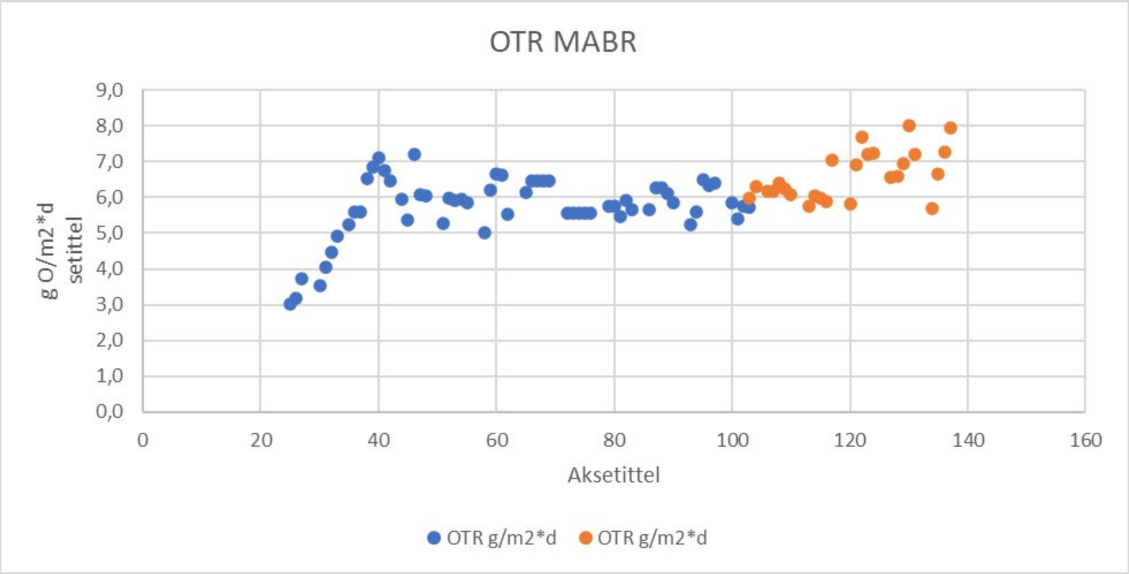


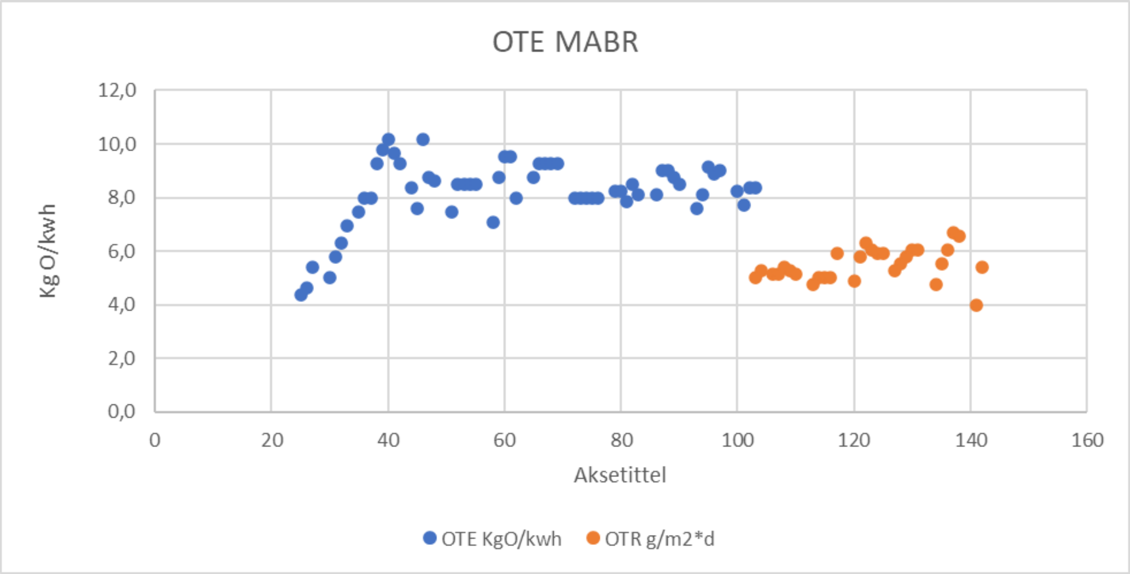



# Organisk last MABR

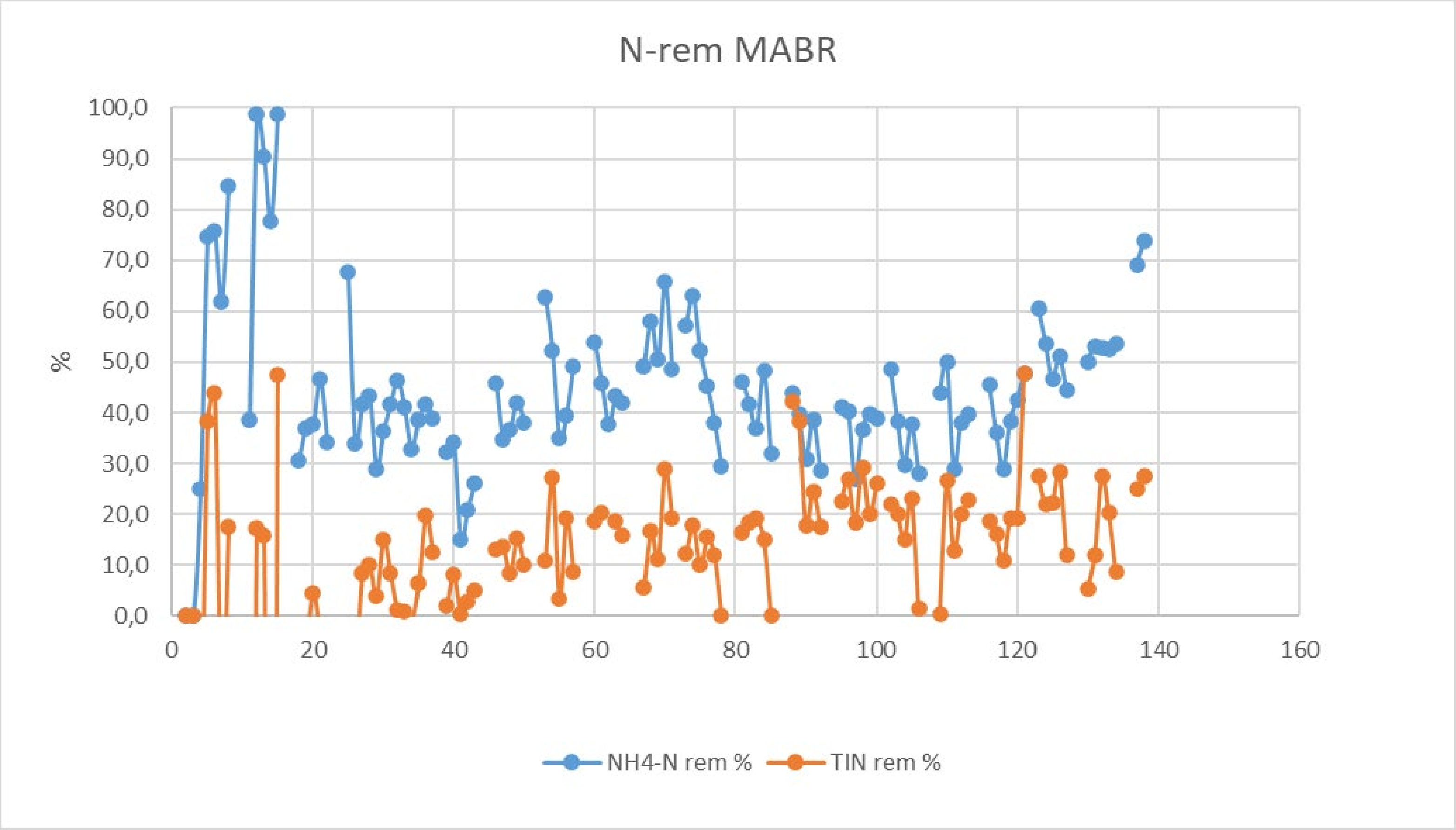




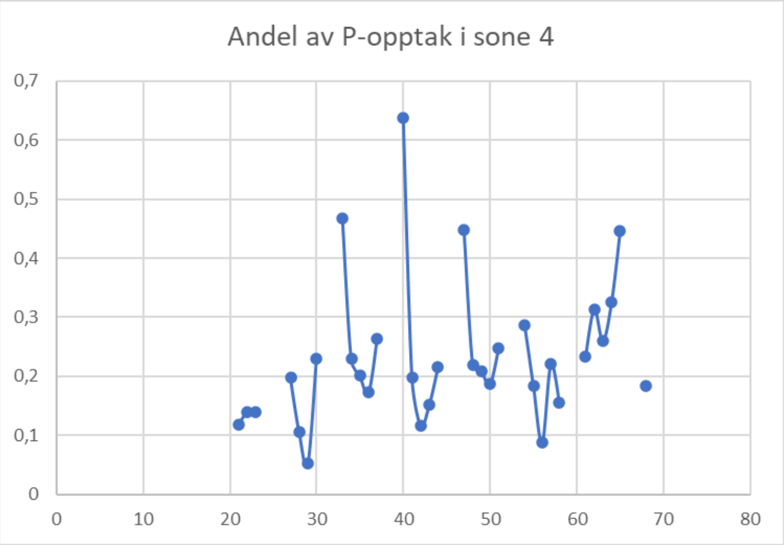




Sammen om et bedre miljø




Sammen om et bedre miljø

# Resultater Hias-pilot + MABR

Hias

Sammen om et bedre miljø