Wastewater treatment in Norway and the revised UWWTD

Elisabeth Lyngstad, Norwegian Water (Norsk Vann)
Johanne Olaussen, KS
Meeting Iceland 25.8.2026

Who are we?

- Elisabeth Lyngstad, Norwegian Water
- Norwegian Water is the national association for the water sector
- Represent 96% of the country's population
- Developing and disseminating expertise
- Developing guidelines and tools for the sector - all reports can be download for free from our homepage
- Advocacy and policy work

- Johanne Olaussen, KS
- The Norwegian Association of Local and Regional Authorities (KS) is the organisation for all local governments in Norway.
- KS is Norway’s largest public employer organisation.
- Research projects and statistics
- Advocacy and policy work

Work closely together on the revised UWWTD

Norway and wastewater treatment

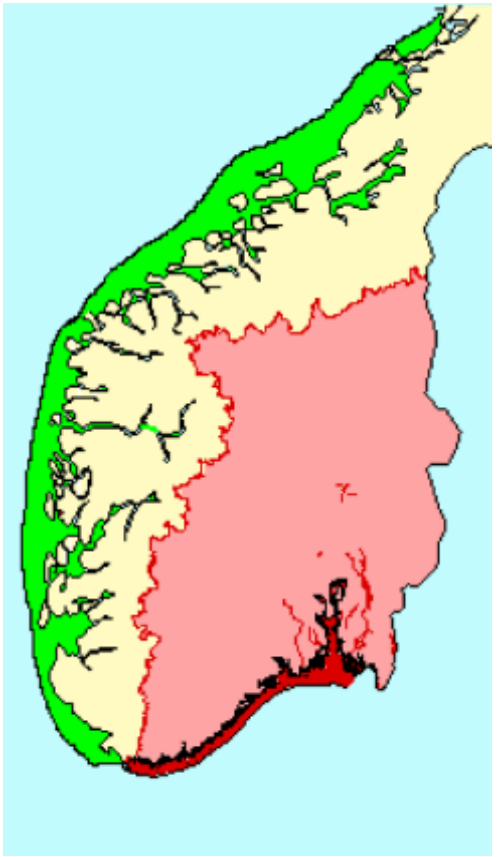
Norway

- The world’s second-longest coastline
- Large amount of freshwater
- The ratio of treated wastewater to the recipient water is normally very low
- Normally no need to use the same waterbody as a source for drinking water
- Large rivers with high water flows, low water temperatures and naturally high oxygen content, deep fjords with good water exchange and open sea
- Vulnerable freshwater lakes and rivers and threshold fjords
- Different natural conditions require different wastewater treatment to achieve the best environmental protection and the most sustainable wastewater treatment.

Norsk Vann

(Old) Treatment philosophy in Norway

1. **Mechanical treatment -** less sensitive coastal areas
   - Removal of trash and large particles
2. **Chemical treatment** - inland and central areas
   - Reduction of phosphorus considered most important
   - Discharge to cold oxygen rich waters
   - (Average yearly reduction of BOD 72%)
3. **Biological treatment –** with the UWWTD from 1991
   - Reduction of dissolved organic matter
   - Normally in addition to chemical P-removal



Less sensitive area
Normal area
Sensitive area

Status Norway (data from 2024)

- 2743 WWTP (<50 pe) covering 88 % of the population
  - 74 % chemical and/or biological treatment (advanced treatment)
  - 21 % mechanical or other treatment
  - 2 % no treatment (only connected to collecting system)
  - 72 % of the population are connected to a WWTP that obtain all the requirements
- 321 000 small wastewater facilities <50 pe (incl. small individual facilities)
  - 737 000 inhabitants
  - normally a sludge separator, possibly with some additional filtration device in the end, or a mini WWTP (with chemical and biological processes)

Supervisory authority and discharge permit

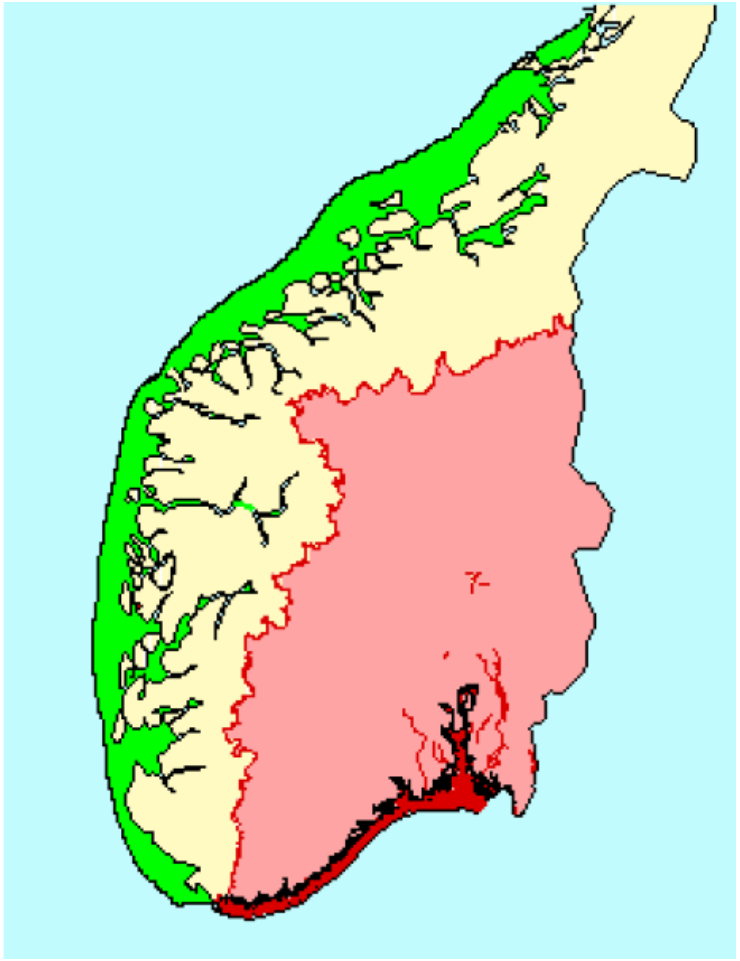
- State administrator is the supervisory authority for agglomerations under the UWWTD
- The municipality is the supervisory authority for smaller agglomerations
- All WWTP must apply for a permit
- The minimum requirements are given in “forurensningsforskriften”
  - Stricter requirements given based on the recipient of the treated wastewater
  - Many now get a maximum tonnes they can discharge to the recipient water
- The application process is quite demanding, costly and takes a long time
- Breach of the permit may result in “byggestopp” – no more sources/houses can be connected

Current treatment requirements

Less sensitive area

- Agglomerations ≥ 10 000 pe (UWWTD):
  - Secondary treatment
  - Can apply for primary treatment based on comprehensive studies (most do)
- Agglomerations < 10 000 pe:
  - Appropriate treatment

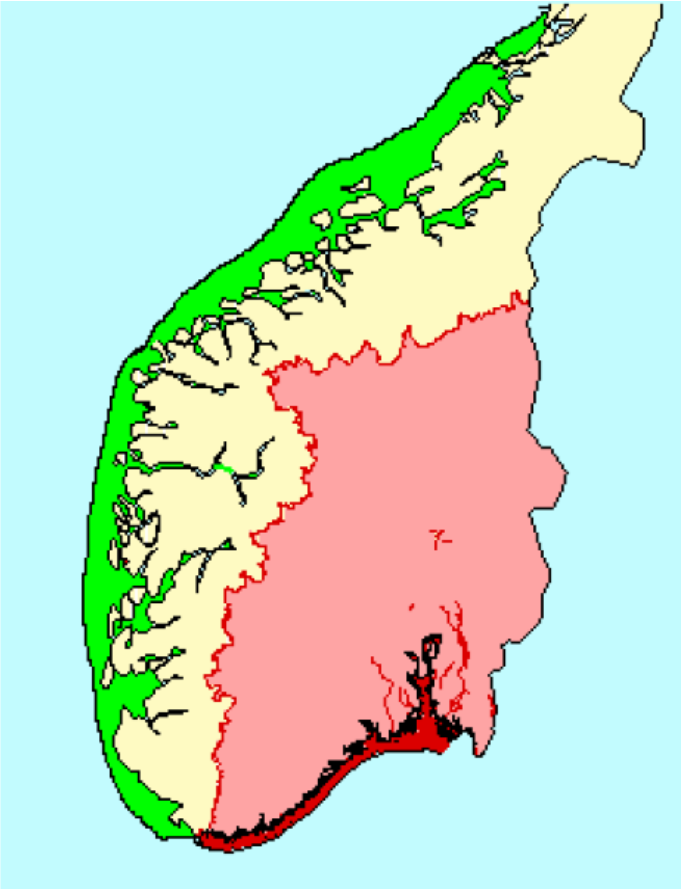
	SS		BOD		COD	
Treatment	%	mg/l	%	mg/l	%	mg/l
Secondary			70	25	75	125
Primary	50	60	20	40		
Appropriate	20	100				



Normal area

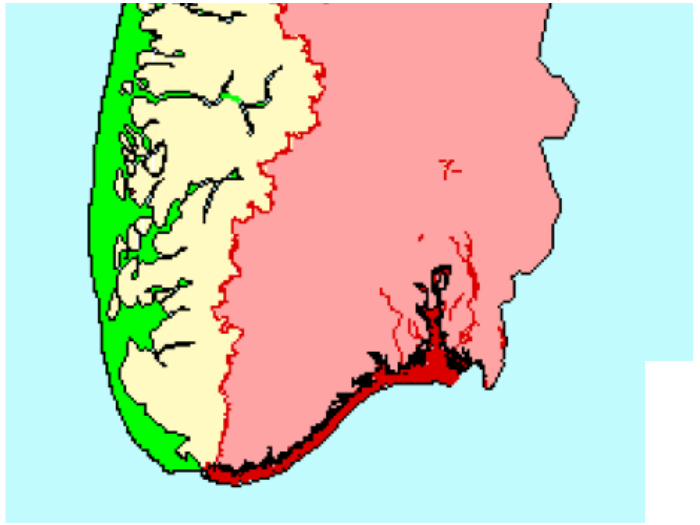
- Agglomerations ≥ 2 000 pe (UWWTD):
  - Secondary treatment

  and
  - Reduction of phosphorus
- Agglomerations < 2 000 pe:
  - Reduction of phosphorus (also remove ~72% removal of BOD yearly average)



	BOD		COD		P
Treatment	%	mg/l	%	mg/l	%
Secondary	70	25	75	125	
Phosphorus					90

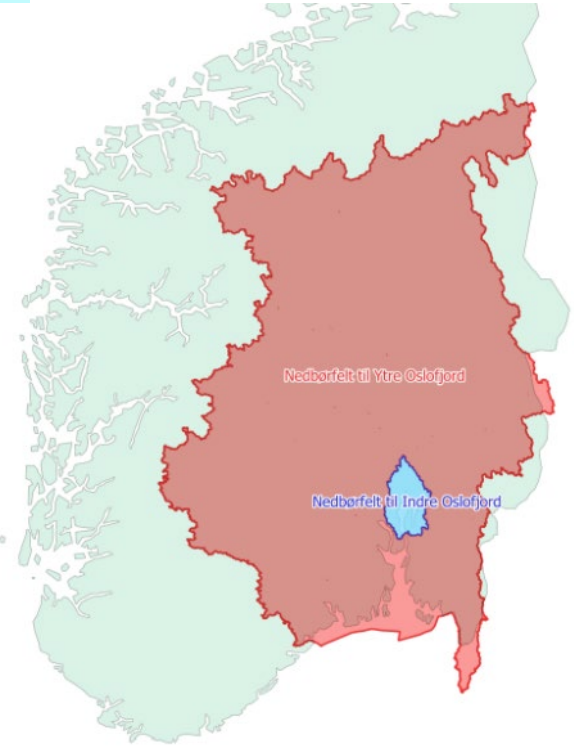
Sensitive area



- Agglomerations ≥ 2 000 pe (UWWTD):
  - Secondary treatment

  and
  - Reduction of phosphorus
  - 6 plants with requirement for nitrogen
  - The whole of Oslofjord became sensitive for nitrogen in 2023
- Agglomerations < 2 000 pe:
  - Reduction of phosphorus

	BOD		COD		P	N
Treatment	%	mg/l	%	mg/l	%	%
Secondary	70	25	75	125		
Tertiary					90	70



Catchment area Oslofjorden

WWTP >50 pe

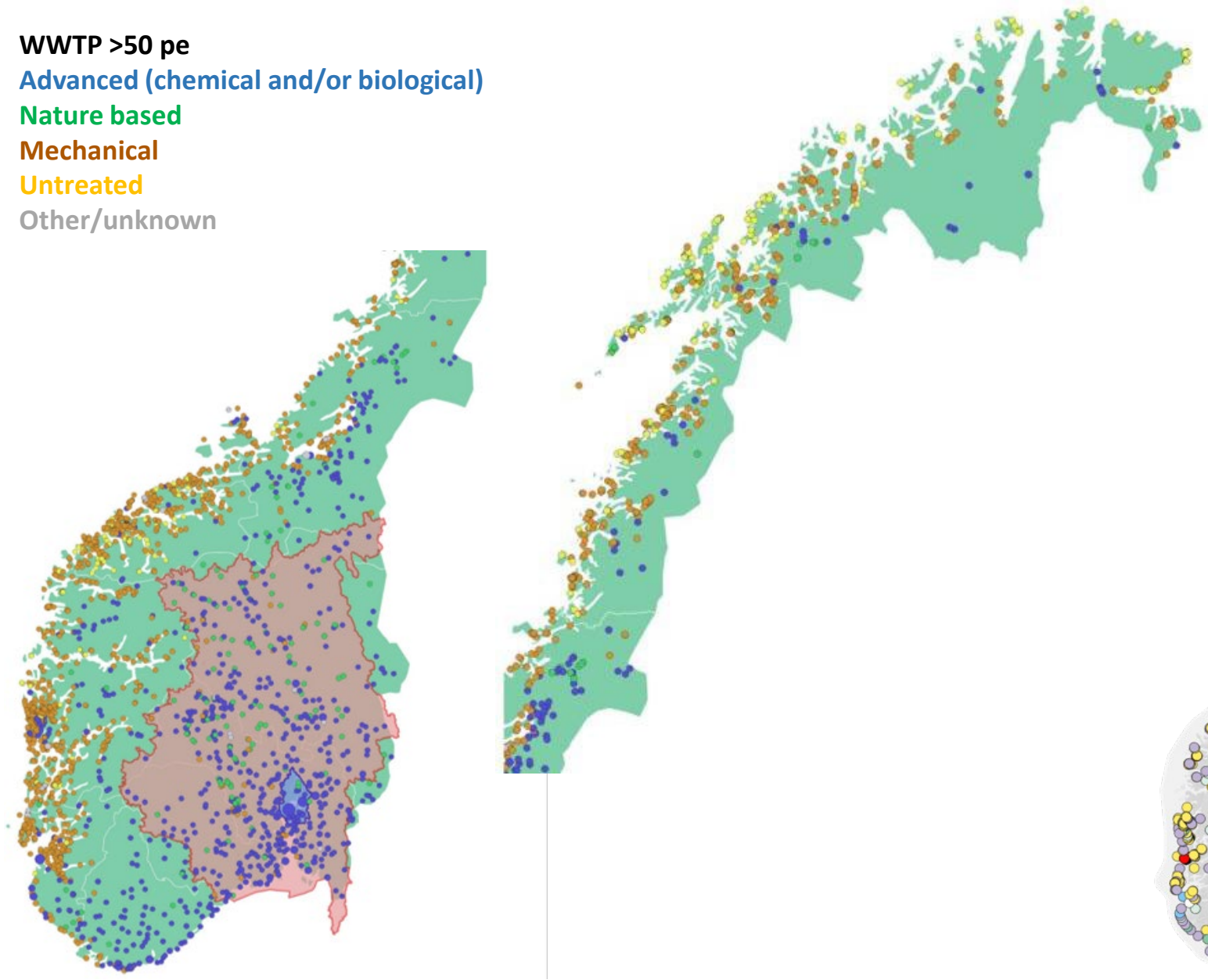
Advanced (chemical and/or biological)

Nature based

Mechanical

Untreated

Other/unknown

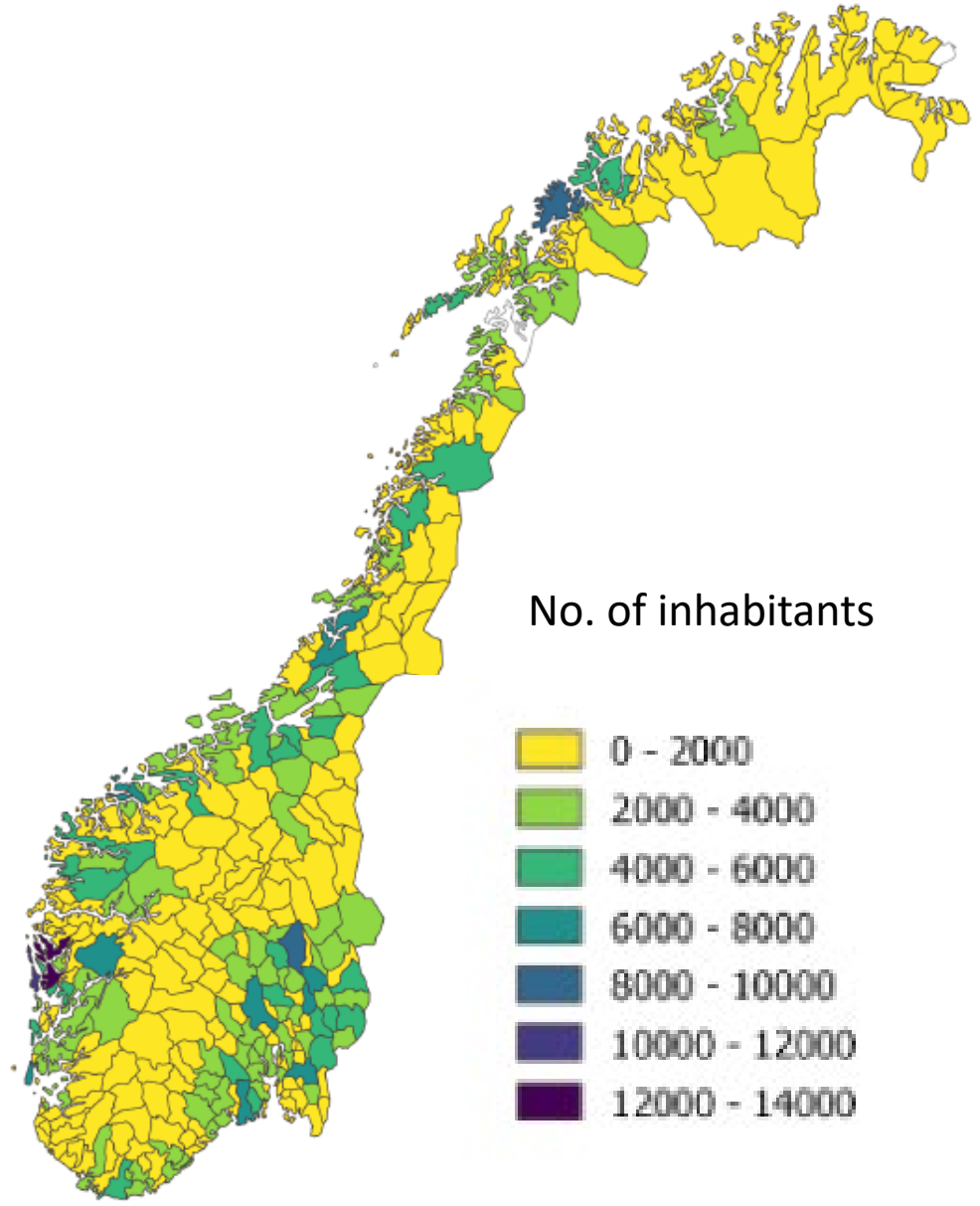


WWTP agglomerations >1000

- Other
- Biological
- Chemical
- Chemical-biological
- Chemical-biological with nitrogen
- Mechanical – screen/filter
- Mechanical – sludge separator
- Naturebased
- Unknown
- Untreated

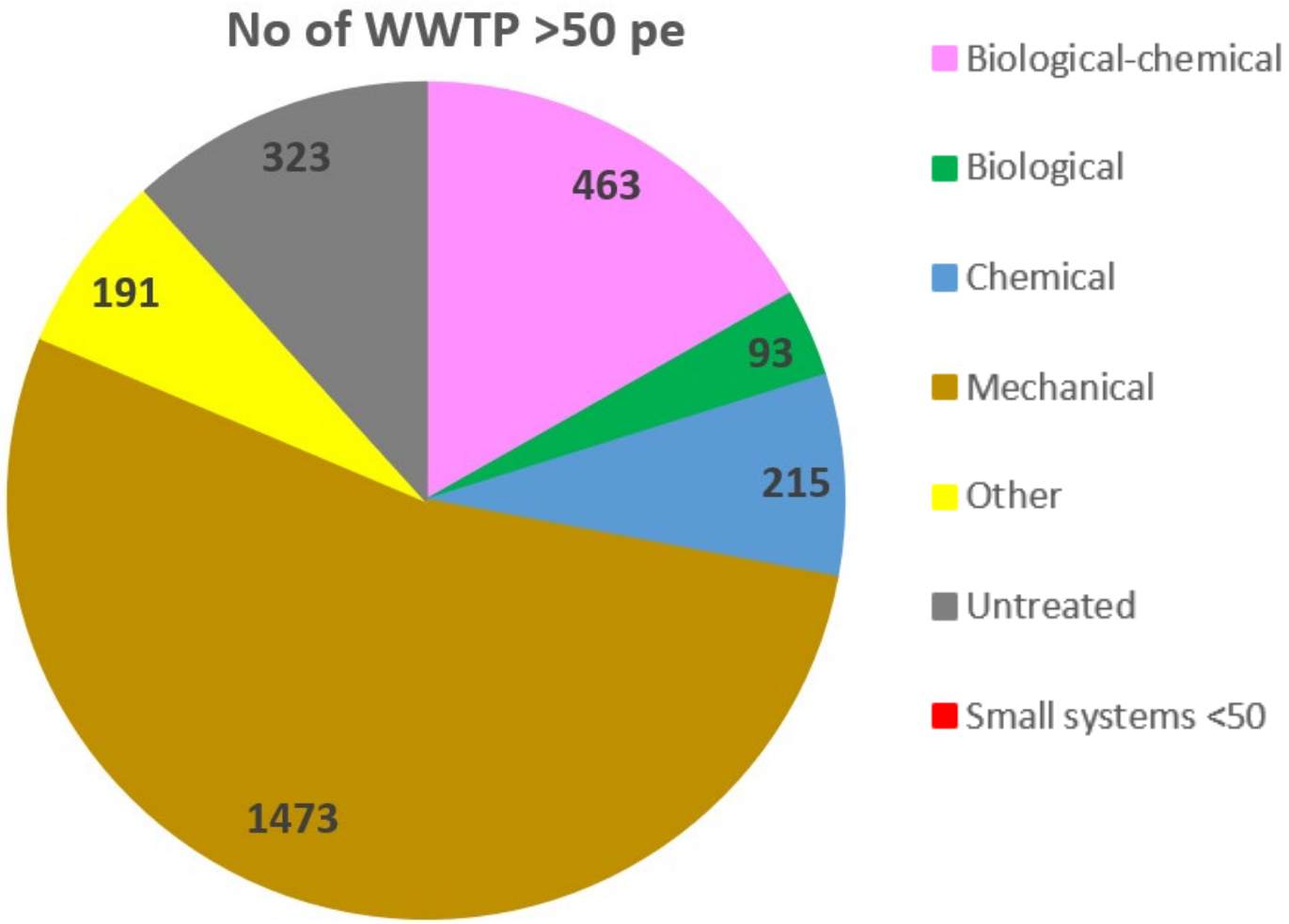
Individual systems <50 pe

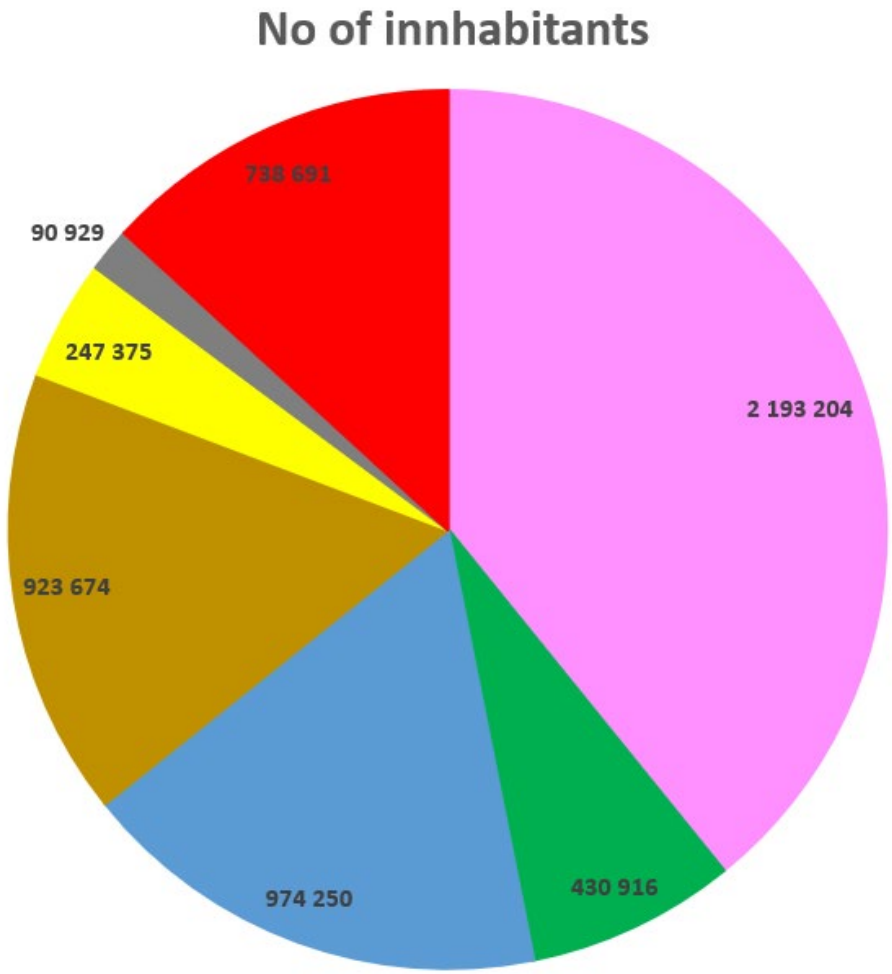
- 320 000 individual systems <50 pe
- 740 000 inhabitants
- Municipality is the supervisory authority
- Must apply for a permit



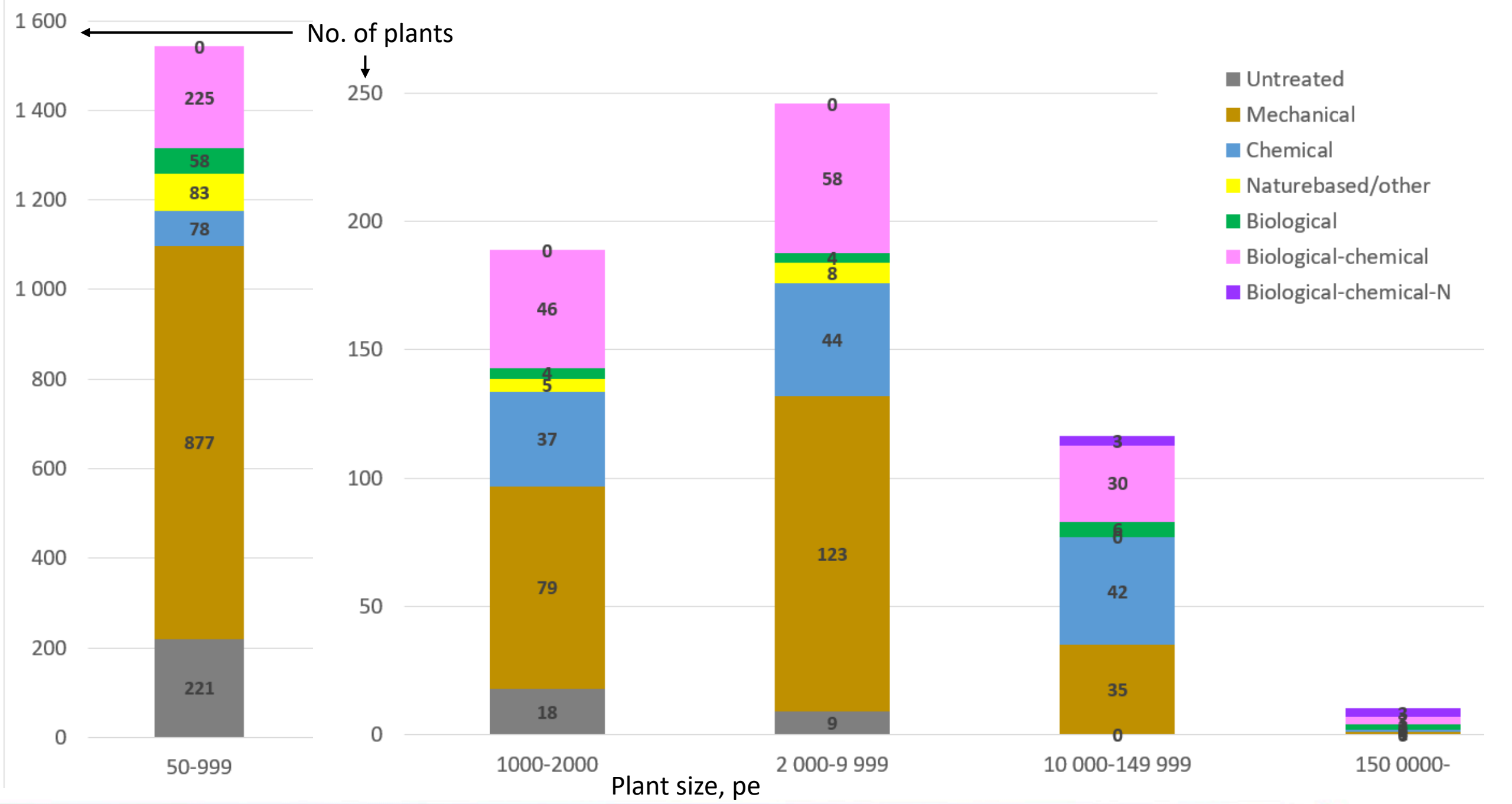
Kilde: Kartverket og KOSTRA, Statistisk sentralbyrå

Types of treatment





+ 320 000 small systems <50 pe


No. of plants
1 600
1 400
1 200
1 000
800
600
400
200
0
250
200
150
100
50
0
0
225
58
83
78
877
221
0
46
4
5
37
79
18
0
58
4
8
44
123
9
3
30
6
0
42
35
0
50-999
1000-2000
2 000-9 999
10 000-149 999
150 0000-
Plant size, pe
Untreated
Mechanical
Chemical
Naturebased/other
Biological
Biological-chemical
Biological-chemical-N

Revised UWWTD

Revisjon of the UWWTD

Directive from 1991	Revised directive 1.1.25

• Protection of the aquatic environment and health
  • Collection and treatment of wastewater
	• Protection of the aquatic environment and health
	  ◦ Collection also from smaller agglomerations and higher treatment of wastewater
	• Reduction of micropollutants and extended producer responsibility
	• Energy neutrality
	• Reducing discharges of untreated wastewater and polluted stormwater from the sewer network
	• Phosphorus reuse/recovery
	• Monitoring of health parameters
	• Transparency/public information
	• Ensuring public toilet facilities

Major changes for Norway

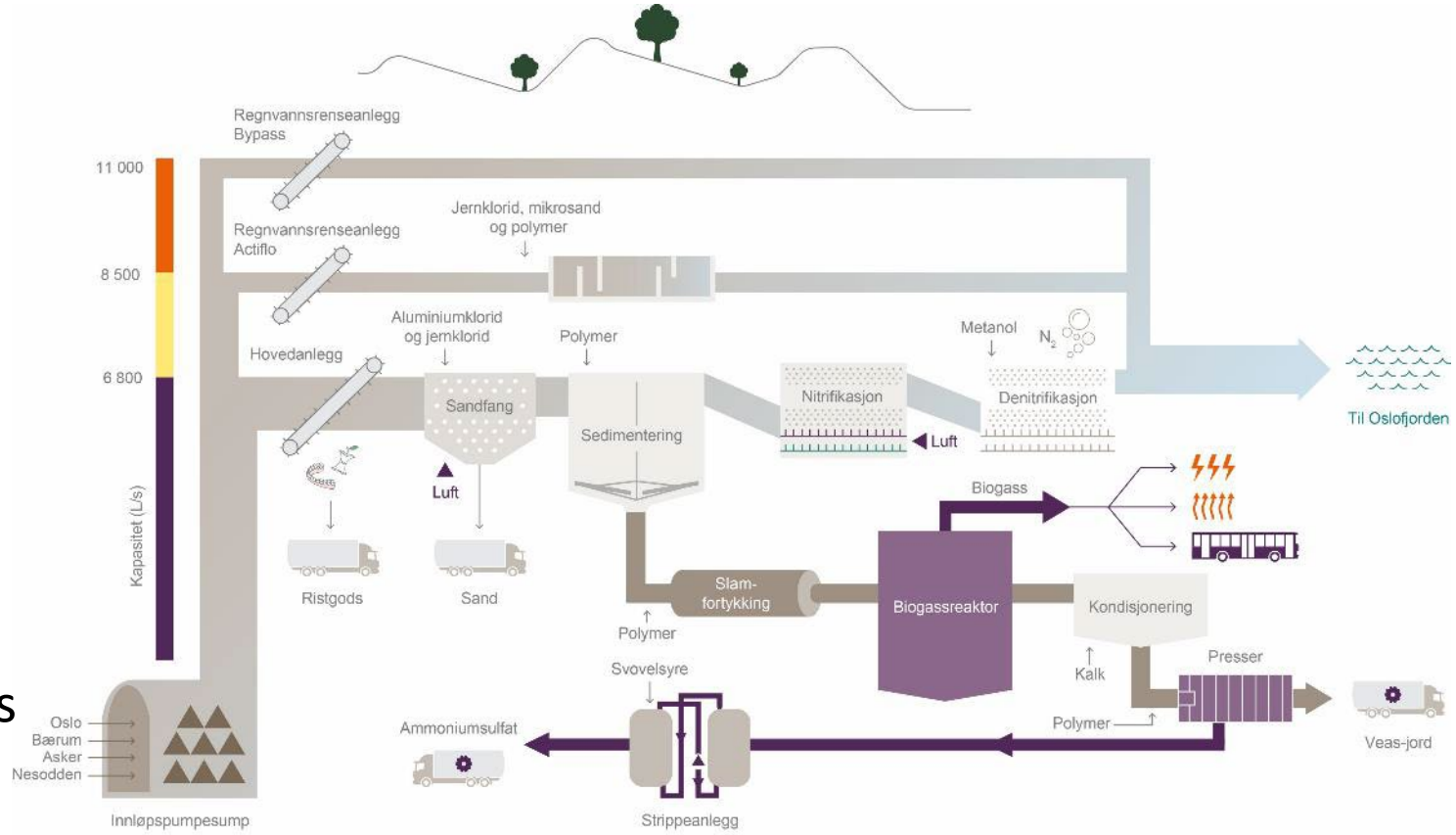
1. Area of application – agglomerations from 1.000 pe
   - Currently, 2,000 PE discharge into fresh water and 10,000 PE discharge into the sea.
   - Significantly more small locations will be covered.
   - 1 PE = equivalent to the pollution load from one person.
   - **All sources and the maximum average week – can be less than 1000 inhabitants**
2. No longer possible to designate areas as less sensitive is being removed
   - No possibility to apply for less stringent treatment requirements, i.e., primary treatment.
   - **The minimum requirement is secondary treatment**
     - Additional requirements for phosphorus, nitrogen, and micropollutants for agglomerations of 10,000 pe or more in sensitive areas.

Major changes for Norway

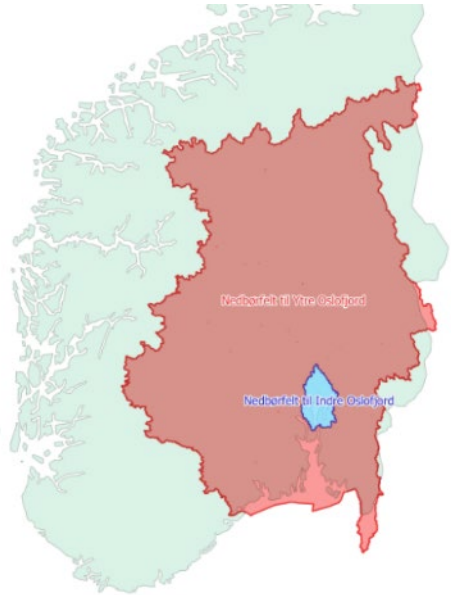
3. Stricter nitrogen removal requirements (70 to 80%)
   - Challenging in cold climates – requires larger volumes, energy, and a carbon source
4. New requirement regarding micropollutants (quaternary treatment)
   - Vulnerable areas must be identified
   - Producers must cover at least 80% of the cost
5. Energy audits and energy neutrality
   - Challenging in cold climates and with energy-intensive treatment requirements
   - Uncertainty regarding which energy sources can be included in the energy balance
6. Development of integrated management plans for discharges from the sewer network
   - Measures on the sewer network to reduce overflows (max. 2%)
   - Reduction of extraneous water (stormwater, snowmelt, infiltration/inflow) required
   - Contaminated stormwater must be treated

Large WWTP (from 150 000 pe)

- Large point-source discharge
- Better conditions
- More inhabitants to share the cost
- Will get all the treatment requirements:
  - secondary treatment, tertiary treatment (phosphorus and nitrogen), and quaternary treatment
  - stricter treatment requirements for phosphorus and nitrogen than smaller plants



Challenges the UWWTD for Norway



1. The extension to include agglomerations from 1 000 pe
   - From 10 000 pe to 1 000 pe for coastal water is significant
2. Secondary treatment as minimum - no primary treatment
   - Might not be the correct treatment for many waterbodies
   - Short deadlines compared to the number of plants
3. Tertiary treatment
   - Norway have today stricter requirement for phosphorus
   - The Oslofjord was put on the list for sensitive areas for nitrogen in 2023 → requirement for a large number of agglomerations, including areas with a large number of cabins where nitrogen removal will be difficult. 80% will be challenging, but outlet concentration of 8 mg/l achievable.
4. Quaternary treatment – unknown number of plants
   - Unknown number of plants - approx. 15 above 150 000 pe
5. Energy neutrality
   - Higher treatment, cold climate and cold water require more energy
6. Integrated urban wastewater management plans

Most significant changes for Norway

1. Agglomerations from 1000 pe to be included

Agglomeration	No. of agglomerations		No. of WWTP	
	Today	+new	Today	+New
1 000 – 2 000 pe	0	+ 163	0	**+268**
2 000 - 10 000 pe	109 [1)]	+ 120 [2)]	166 [1)]	**+286 [2)]**
≥ 10 000 pe	51	+ 0	64	**+0**
Sum	160	+ 283	230	**+554**

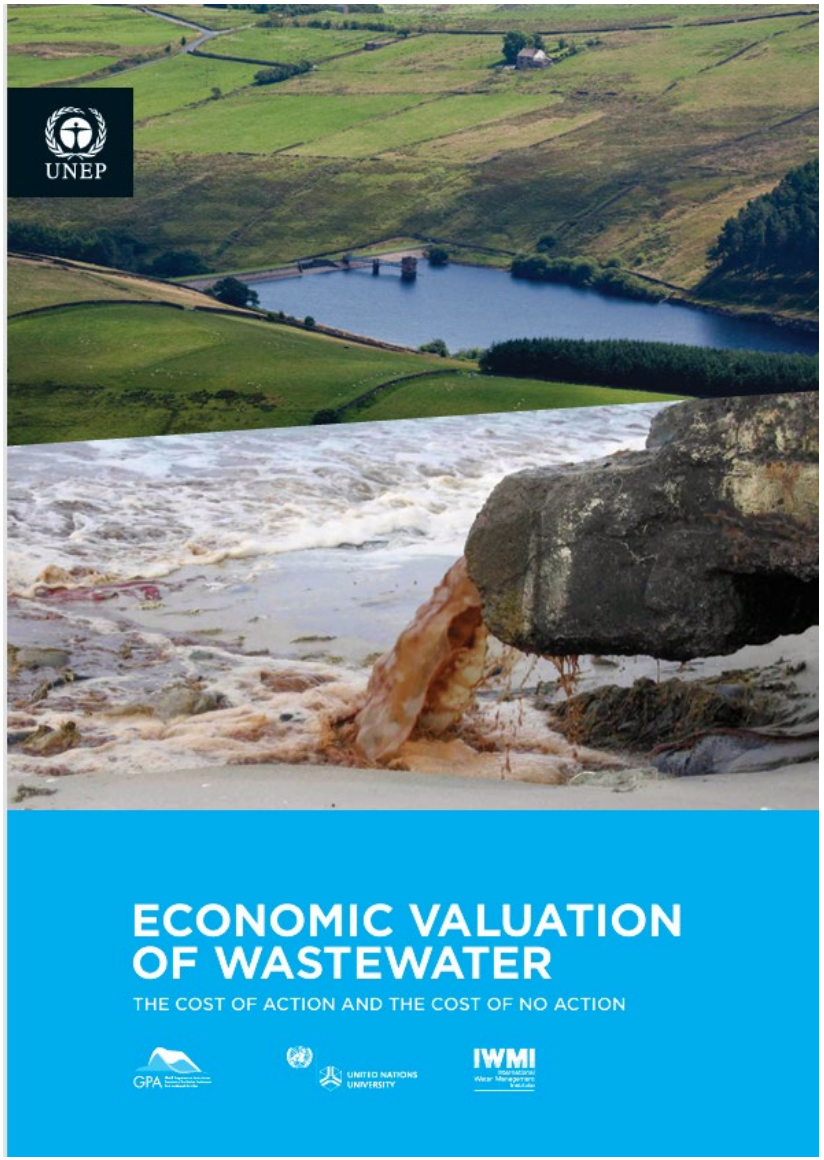
[1)] Discharge to fresh water [2)]Discharge to seawater

2. No longer possible to define areas as less sensitive

Less sensitive area	No. of agglomerations	No. of WWTP
Can apply for primary treatment	44	**196**

Approx. 750 WTTP will get a new requirement for secondary treatment

The value of increased treatment


UNEP
ECONOMIC VALUATION OF WASTEWATER
THE COST OF ACTION AND THE COST OF NO ACTION
GPA
UNITED NATIONS UNIVERSITY
IWMI


Benefits of stricter discharge requirements in the revised Urban Wastewater Treatment Directive
osloeconomics
NIVA
Akvaplan niva
KS FoU

Background for the R&D project: How should the benefits of stricter discharge requirements in the revised Wastewater Directive be assessed in the context of Norwegian conditions?

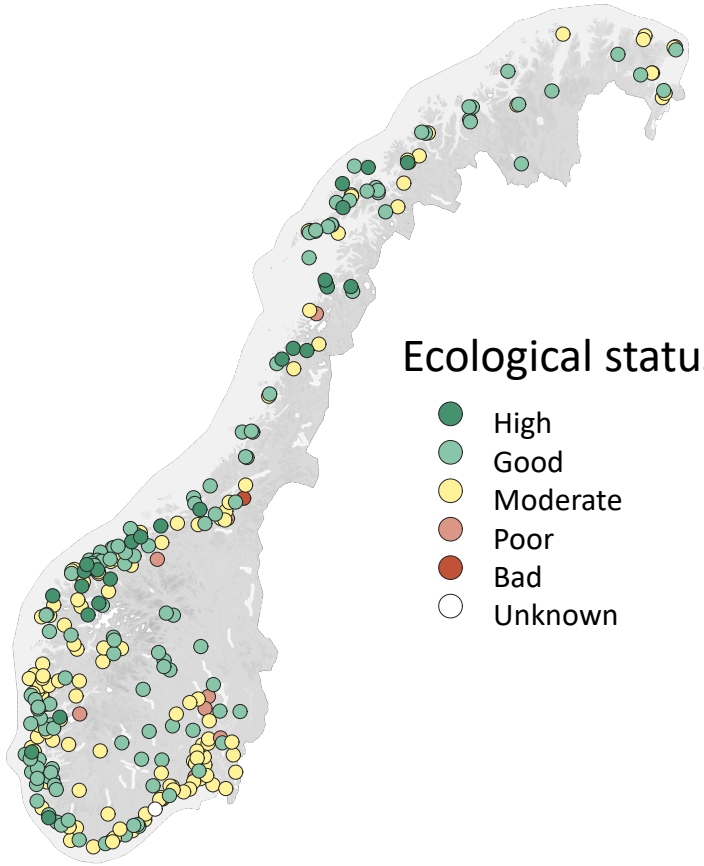
The EU has used an average benefit value of 50 euros per tonne of BOD (biochemical oxygen demand) reduced, regardless of where the discharge occurs.

The report "Economic Valuation of Wastewater" shows that the value can be as low as 5 euros per tonne when discharged into the sea.

If Norway uncritically adopts EU values in its own analyses, it risks overinvesting in measures with little actual benefit, while simultaneously undermining its ability to argue for adjustments during EFTA negotiations.

Many Norwegian water bodies are already in good ecological condition, but there is uncertainty regarding the risk of eutrophication.

Ecological status of water bodies associated with wastewater treatment plants ≥ 1,000 pe



Ecological status

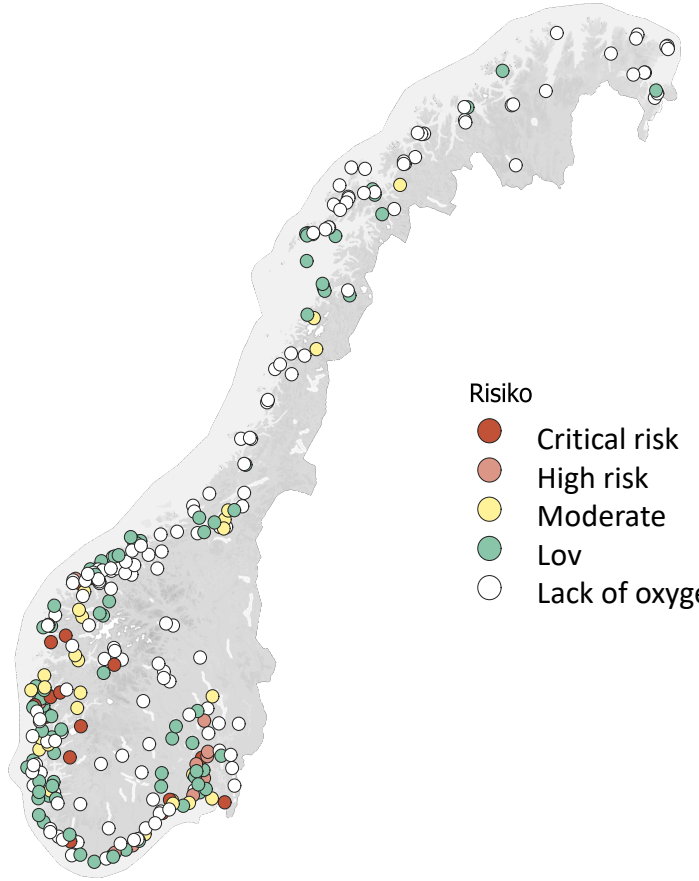
- High
- Good
- Moderate
- Poor
- Bad
- Unknown

Klassifisering	Ecological status	Oxygen (deep water)	Phyto-plankton
Svært god	0,00	0,00	0,00
God	0,25	0,25	0,25
Moderat	0,50	0,60	0,50
Dårlig	0,75	0,85	0,75
Svært dårlig	1,00	1,00	1,00
Vekting	**0,2**	**0,5**	**0,3**

Risikoscore

(lav, moderat, høy, kritisk)

Risk of eutrophication in water bodies associated with wastewater treatment plants ≥ 1,000 pe



Risiko

- Critical risk
- High risk
- Moderate
- Lov
- Lack of oxygen data

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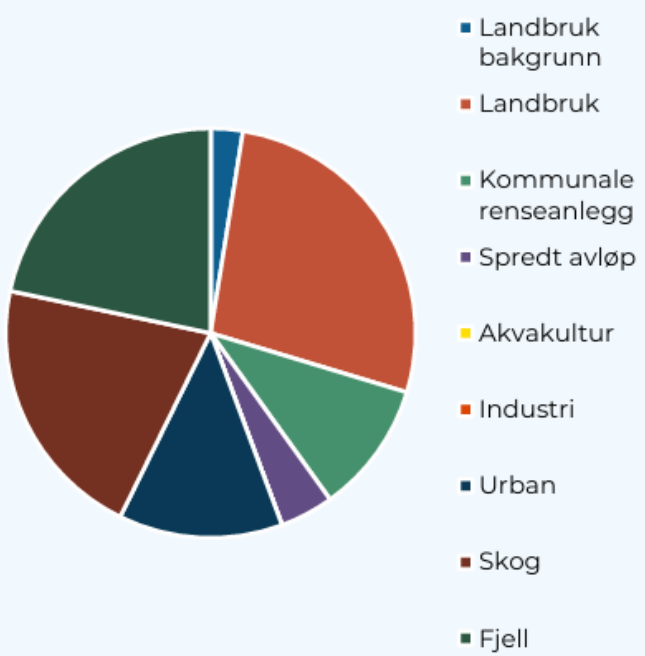
Cases

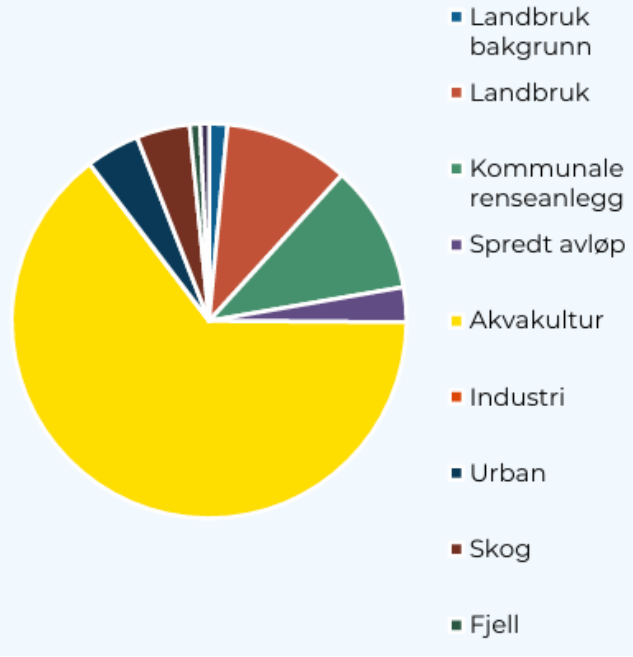
Figur 5-34: Total potensiell TOF for Krøderen



Tabell 5-20: Modellert oksygenkonsentrasjon i bunnvannet med dagens rensing og endrede krav

Beskrivelse	Oksygen-konsentrasjon år 20 (mg O2/L)	Tilstandskategori oksygen-konsentrasjon
Dagens rensing	10,01	God
Sekundærrensekrav	10,08	God

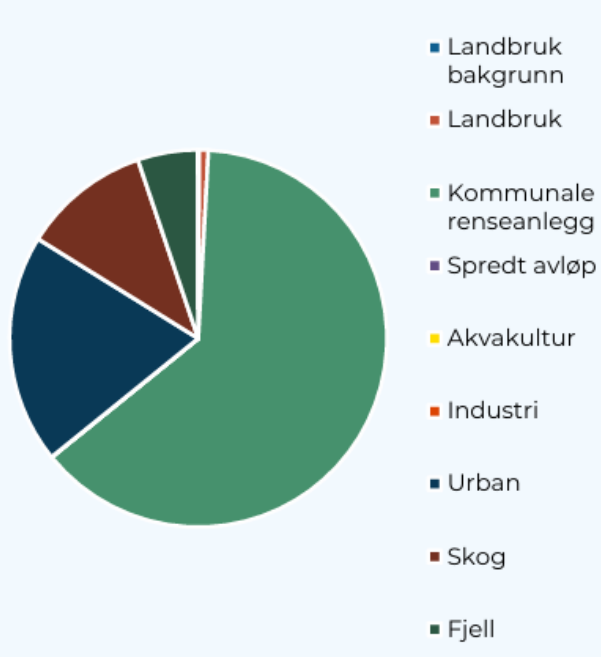
Figur 5-24: Total potensiell TOF for Bømlafjorden



Tabell 5-14: Modellert oksygenkonsentrasjon i bunnvannet med dagens rensing og endrede krav

Beskrivelse	Oksygen-konsentrasjon år 20 (mg O2/L)	Tilstandskategori oksygen-konsentrasjon
Dagens rensing	7,26	Svært god
Sekundærrensekrav	7,30	Svært god
Tertiærrensekrav P	7,30	Svært god
Tertiærrensekrav N	7,31	Svært god

Figur 5-14: Total potensiell TOF for Sørfjorden Indre del



Tabell 5-8: Modellert oksygenkonsentrasjon i bunnvannet med dagens rensing og endrede krav

Beskrivelse	Oksygen-konsentrasjon år 20 (mg O2/L)	Tilstandskategori oksygen-konsentrasjon
Dagens rensing	4,35	Moderat
Sekundærrensekrav	5,06	God

Limited applicability of benefit estimates for EU to the Norwegian context

METHODOLOGICAL LIMITATIONS REGARDING THE TRANSFERABILITY OF THE EU'S BENEFIT ESTIMATES:

The benefit estimate used in the EU's impact assessment is based on a single Spanish study from a specific region in Spain, utilizing data from 2004.

- The study estimates shadow prices for various pollutants (nitrogen, phosphorus, biological oxygen demand (BOD))—based on avoided treatment costs—across different water bodies. Consequently, it does not capture the full scope of benefits, such as biodiversity, outdoor activities, and recreation.
- The EU employs conservative, rounded estimates derived from the study's shadow prices (expressed as euros per tonne of BOD reduction) to arrive at a general benefit estimate that is applied regardless of the specific receiving water body.

NORWAY HAS A DIFFERENT TOPOGRAPHY THAN SPAIN AND OTHER EU COUNTRIES.

- Norwegian water bodies vary significantly in type, hydrology, ecological status, and vulnerability to eutrophication, as well as in usage and settlement patterns.
- The benefits will also depend on existing treatment levels, environmental status, and the water body's vulnerability to eutrophication.
- Norway has already implemented extensive wastewater treatment, particularly regarding phosphorus removal and treatment in sensitive areas. This means that the marginal environmental impact of stricter treatment requirements will, in many cases, be limited.

A single, general shadow price for emissions would be ill-suited for calculating the benefits of modifying treatment at Norwegian wastewater treatment plants in accordance with the revised

In many locations, meeting the directive's stricter treatment requirements will yield limited benefits.

MUCH OF THE ENVIRONMENTAL BENEFIT HAS ALREADY BEEN REALIZED

- Norway has already implemented extensive wastewater treatment, particularly phosphorus removal and treatment in sensitive areas. Reducing phosphorus discharges has been an effective measure for improving ecological status.
- As a result, a significant portion of the potential environmental gain associated with wastewater treatment has already been achieved.

LIMITED MARGINAL BENEFIT FROM FURTHER TIGHTENING

- Revised and stricter requirements in the updated wastewater directive will, in many cases, have a limited effect on ecological status.
- For water bodies with good or very good status, or where wastewater accounts for a small share of the total load, increased treatment yields minor or negligible improvements.
- At the same time, improved treatment can provide significant benefits for water bodies with moderate or poor status, particularly where the risk of eutrophication is high.

THE COSTS OF MEETING NEW REQUIREMENTS CAN BE SUBSTANTIAL AND MAY EXCEED THE BENEFITS

- The report highlights the benefits of stricter treatment requirements at a high level but does not assess socio-economic cost-effectiveness, as the costs of implementing measures are not evaluated.
- The requirements in the revised directive could trigger substantial investments and increased operating costs, including for secondary treatment and the upgrading of existing facilities.

Improved treatment may be beneficial, but should be based on local assessments of treatment needs and alternative measures

THE TREATMENT REQUIREMENT MUST BE ADAPTED TO THE NEEDS OF THE RECEIVING WATER BODY, AND UNTREATED DISCHARGES MUST BE STOPPED.

The analysis conducted assumes compliance with current treatment requirements and focuses solely on the additional benefits of the stricter treatment requirements in the revised directive.

- Some discharges do not meet the requirements of current regulations.
- It is important to document the need for and the impact of the (treatment) measure.

NEED FOR LOCAL ASSESSMENT TO ENSURE PROPER TREATMENT AND EFFECTIVE MEASURES

The overall effect of treatment on discharges of oxygen-consuming substances, as well as the significance of the discharge location and depth, should be assessed for each individual water body.

The impact on adjacent water bodies (coastal waters) and downstream areas (rivers, lakes, and coastal waters) should be included in the assessments.

Measures other than enhanced wastewater treatment may be more effective in reducing inputs and/or improving oxygen conditions in the bottom water.

Our concerns

- The benefit analysis show that the minimum requirement of secondary treatment is too high in many areas
- Costly investments with low benefit is unfortunate
  - Difficult to explain and justify to inhabitants facing a large increase in municipal fees
  - Diverts limited resources from other necessary measures that gives a higher benefit
  - Excessively high municipal fees in small communities can lead to depopulation - important to maintain settlement in small areas, particularly in the north, for security policy reasons
  - Negative perception of the EU and regulations
  - Building an operating WWTP have an environmental footprint, and the positive benefits should outweigh the negative

What can Norway do

The EEA proses

- Adress the requirement of secondary treatment from small settlements in less sensitive areas (ref our concerns)
- Transposition deadline
  - It is reasonable that the EFTA countries should have the same number of months (30) from the Directive's entry into force in the EFTA countries as the EU Member States have.
- Deadline for secondary treatment
  - Norway should request a longer deadline for plants in agglomerations above 2,000 p.e. that discharge into areas currently defined as less sensitive.
- Energy neutrality
  - The requirement must be achievable - cold climate and low population density
- Extended producer responsibility and quaternary treatment
  - EPR must be a requirement for quaternary treatment

The national implementation

- Thorough assessments must be conducted in collaboration with the different parts of the wastewater sector to find the most appropriate implementation.
  - The legislation must be practicable and sensible in relation to the objectives to be achieved - small details are significant
- The national definition of agglomeration must not be stricter than in the directive, 10-25 pe/ha.
  - Of 149 agglomeration between 1000 – 10 000 pe (in less sensitive area) 44 have less than 10 pe/ha. Only 2 above 25 pe/ha.
- Requirements for nitrogen must be given as % or concentration
  - Norway have diluted and cold wastewater and a reduction of 80% requires an outlet concentration of less that 5 mg/l. The limit in the revised directive is 8 mg/l for > 150 000 pe.

Agglomeration

Definition revised UWWTD:

4) ‘agglomeration’ means an area where the population expressed in population equivalent, combined or not with economic activities, is sufficiently concentrated for urban wastewater to be collected and conducted to one or more urban wastewater treatment plants or to one or more final discharge points;

From the preamble:

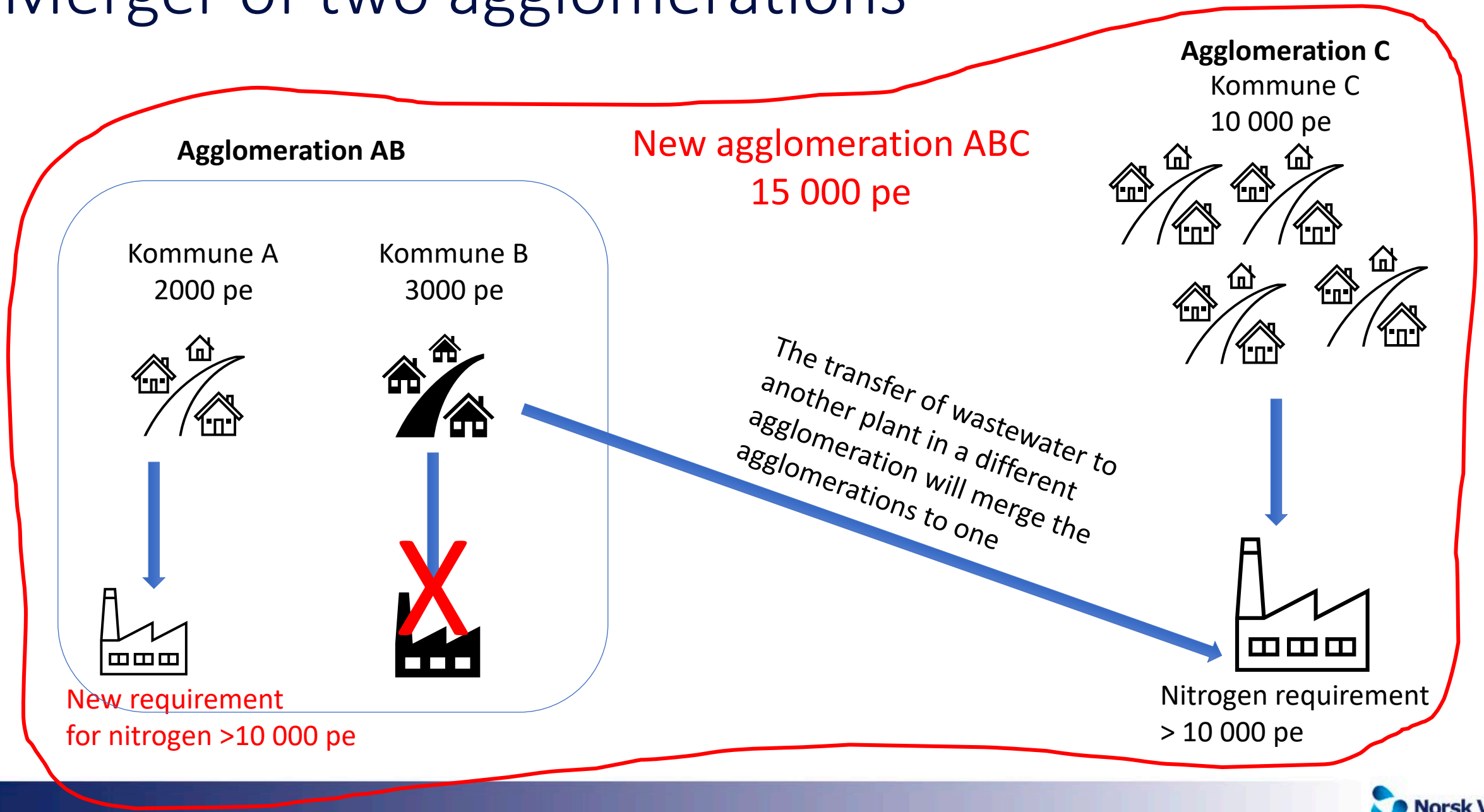
When delineating their agglomerations, Member States should take into account the indicative reference threshold of 10 to 25 p.e. per hectare, above which the population, possibly combined with economic activities, located in a specific area is considered sufficiently concentrated

Current Norwegian definition:

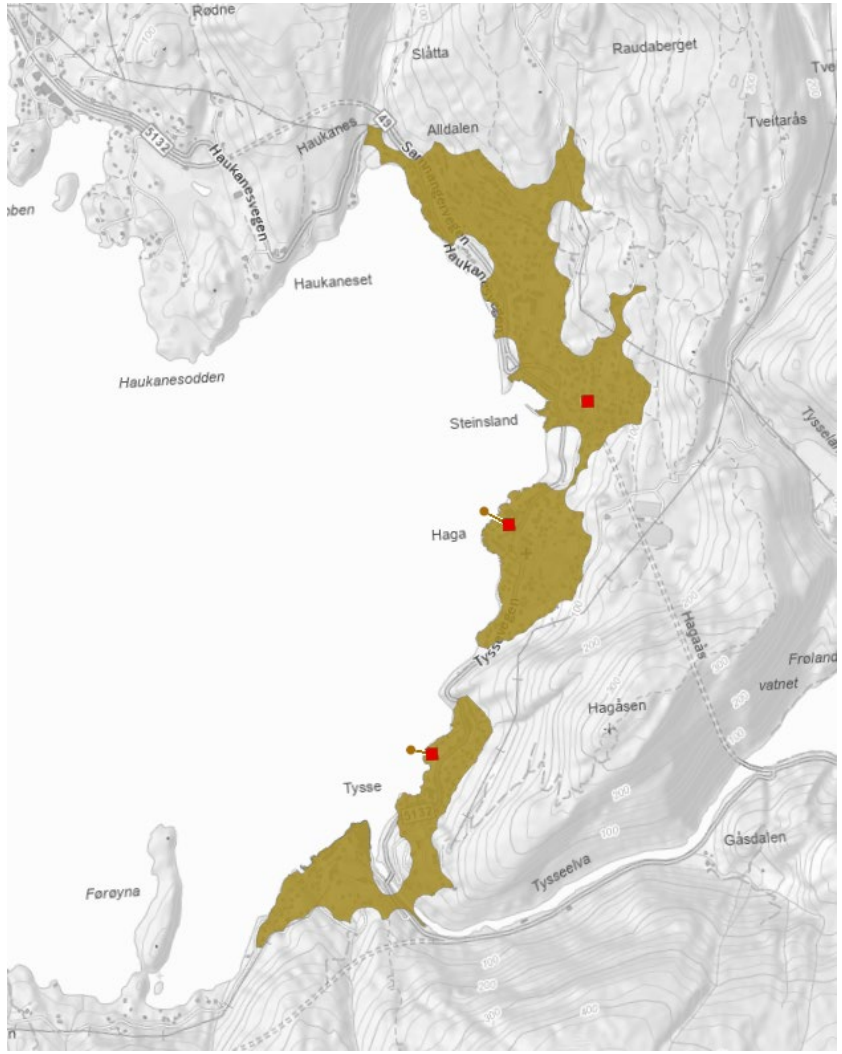
A collection of houses where the distance between the houses is not more than 50 meters. For larger buildings, including blocks of flats, offices, warehouses, industrial buildings and sports facilities, the distance may be up to 200 meters to one of the houses in the housing area. Housing areas with at least five buildings, which are located less than 400 meters outside the boundaries in the first and second sentences, shall be included in the agglomeration.

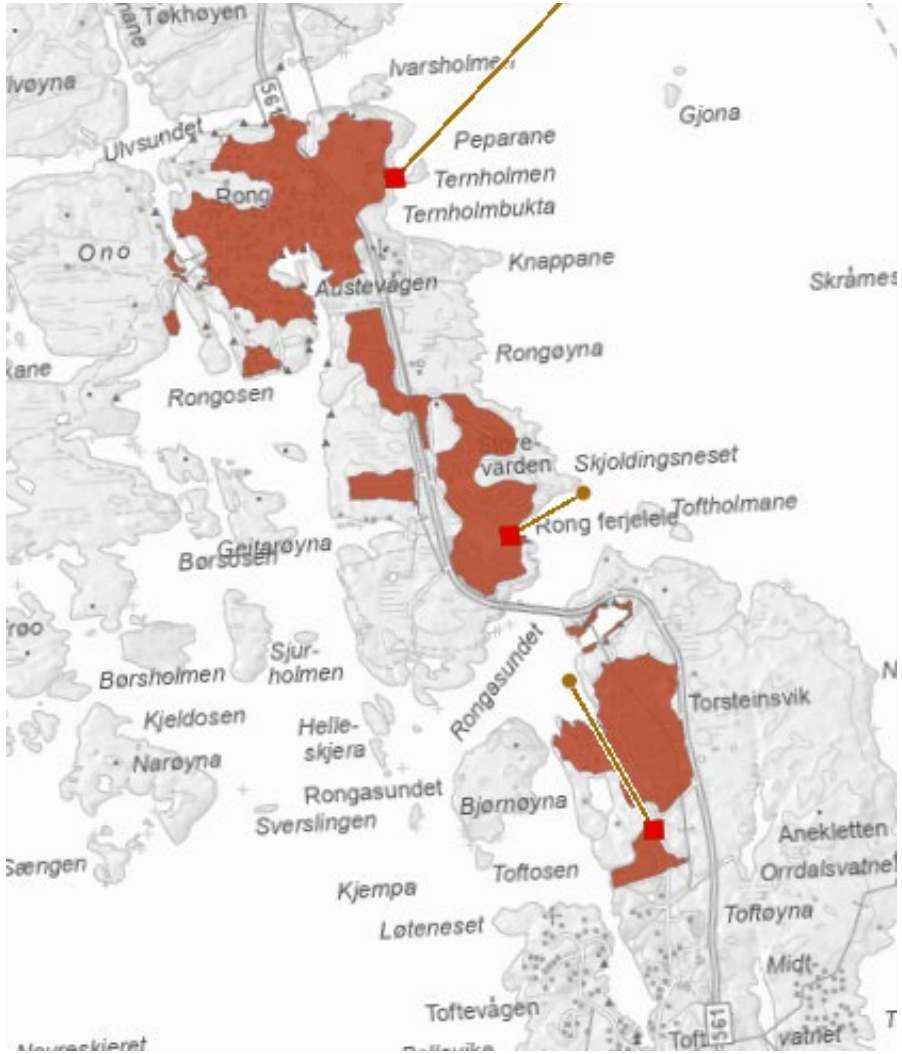
If wastewater from two or more agglomerations, as mentioned in the first paragraph, is collected and led to a common treatment plant or discharge point, the agglomerations are considered to be one agglomeration.

Merger of two agglomerations



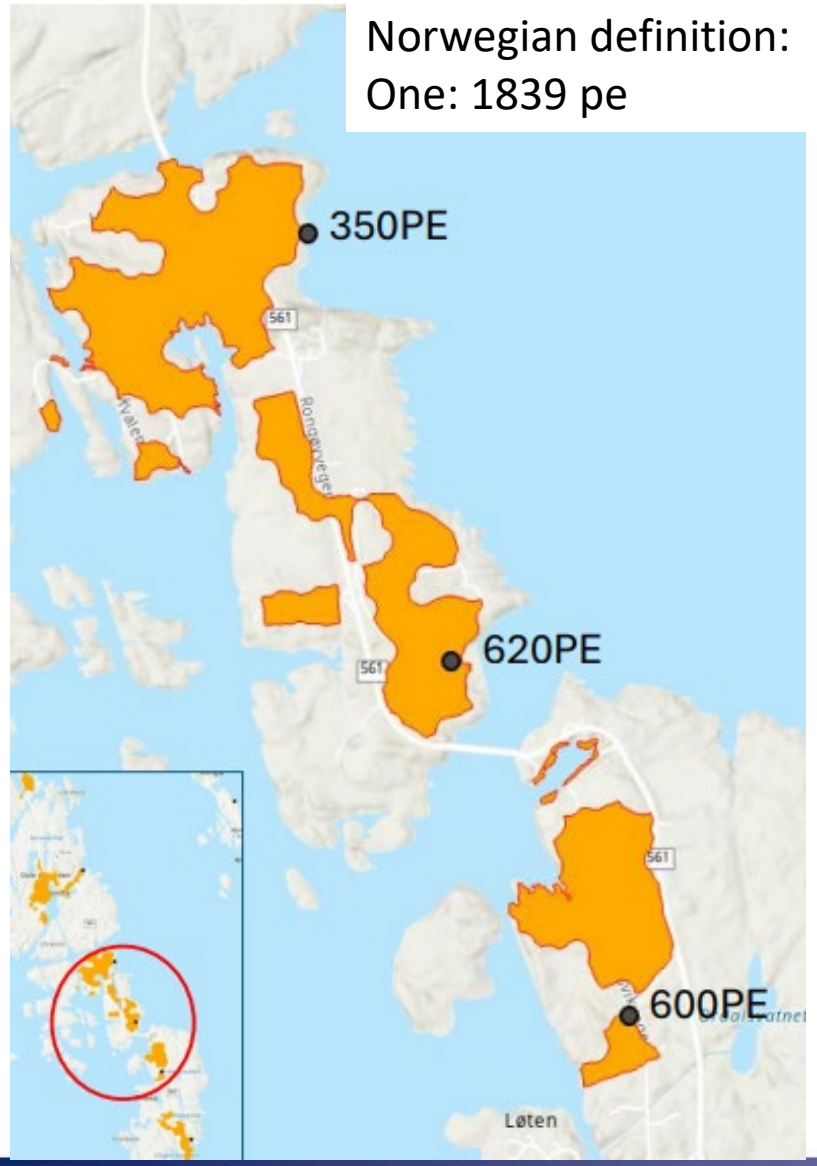
Typical agglomerations along the coast



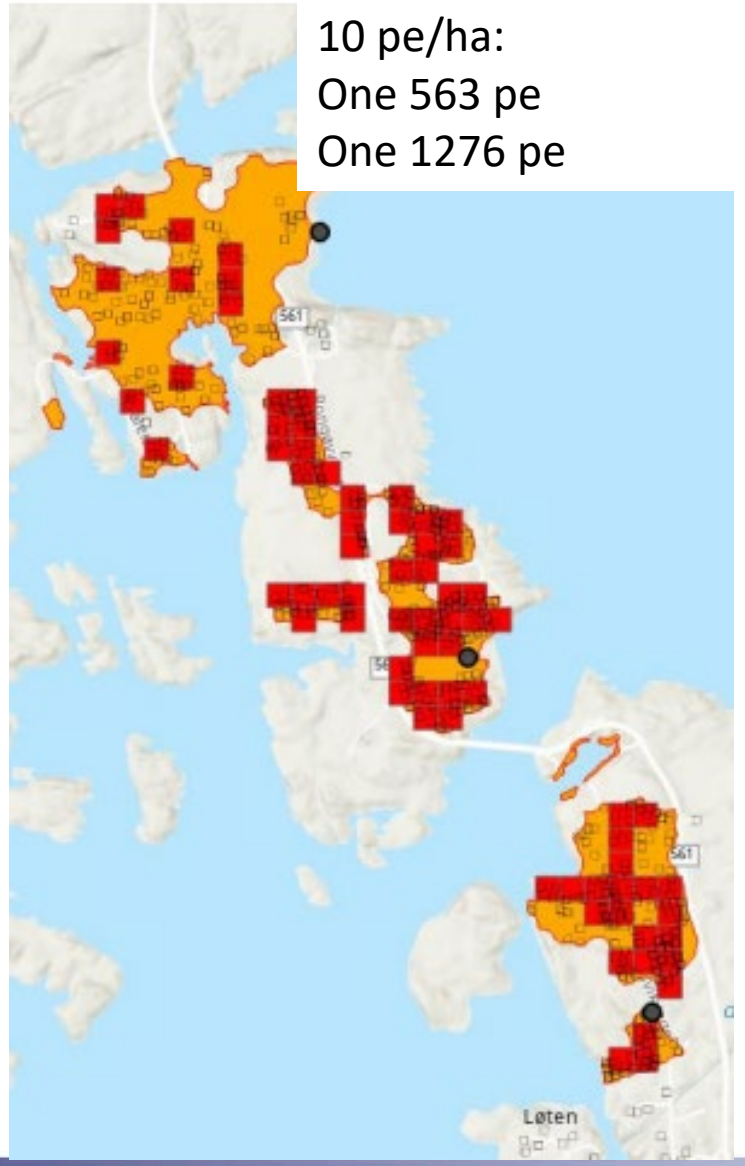


Definition of agglomeration is important

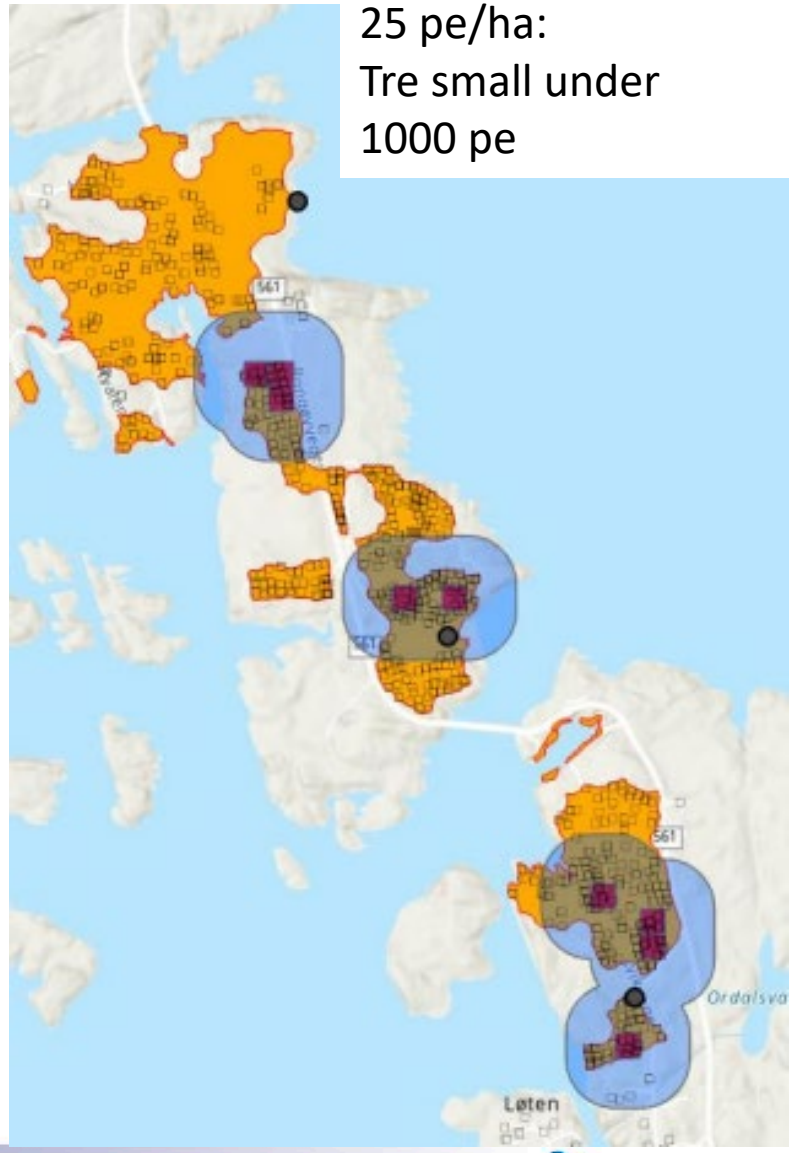
Norwegian definition:
One: 1839 pe



10 pe/ha:
One 563 pe
One 1276 pe



25 pe/ha:
Tre small under
1000 pe



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Conclusion

Consequences of new requirements

- Many facilities require modification, or new ones must be built
- New and stricter treatment requirements lead to larger, more complex facilities
  - May require a new location due to insufficient site size
  - Need for increased staffing and expertise
  - Consolidation of facilities into larger shared plants – requires associated pipeline networks and long transfer lines
- Increased use of biological treatment plants – microorganisms perform the work
  - Requires aeration; processes slow down in cold water, and time is needed for the organisms to "feed"
  - High levels of infiltration/stormwater inflow → diluted and cold wastewater → larger facilities + higher energy consumption + higher operating costs
  - Requires major upgrades to the pipeline network
- Additionally, there are requirements to reduce discharges of untreated wastewater from the network and contaminated stormwater runoff

Treatment plants (resorce recovery facilities)

1. Nutrient recovery
   - Phosphorus – nitrogen – other?
2. Reduction of energy consumption and energy production
   - Low-energy equipment and processes
   - Explore opportunities for increased production and new types of energy
3. Greenhouse gas emissions
   - Facilitate for measurement
4. Control, monitoring, sampling/documentation
   - Need for smarter control systems
   - Effective self-monitoring – in-house lab
5. Competence
   - More complex plants to operate
   - New skills/competence requirements

Many conflicting demands

Collection systems

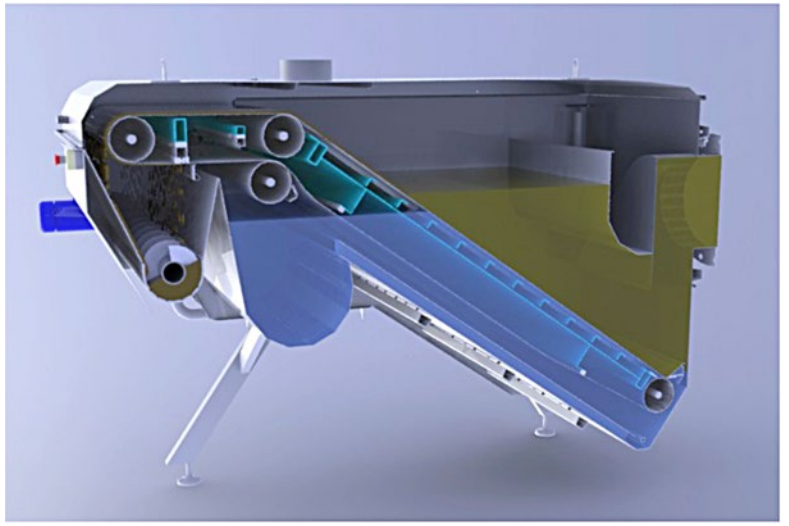
- Requirements for collection systems and connection
- Reduction of extraneous water
  - Transporting and treating rainwater is costly and energy-intensive
  - Difficult to treat dilute (low-concentration) and cold water
- Documentation and reduction of overflow discharges
  - Measurement, calculation, and modeling
- Contaminated stormwater must be treated
  - Mapping, calculation, and reduction of discharges
- Remember: energy audits include the pipeline network
  - Energy-efficient pumping stations
  - Avoid unnecessary pumping of stormwater
  - Energy consumption must be logged

Costs

- Wastewater treatment plant costs:
  - Large plants with nitrogen removal: 13–26 billion ISK?
  - Large plants with secondary treatment (>10.000 PE): 2 202 million ISK?
  - Smaller plants with secondary treatment (<10.000 PE): 520–780 million ISK?
- And then there are:
  - Associated pipeline networks and pumping stations
  - Operating costs (energy, chemicals, sludge)
  - Increased need for operating personnel → personnel costs
- Larger plants can be advantageous – but assessments must include wastewater transport

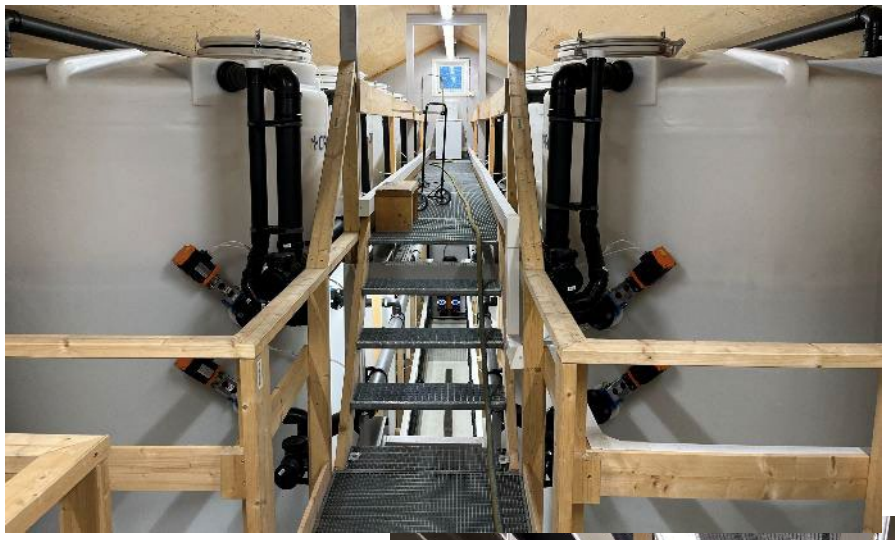
Treatment plants

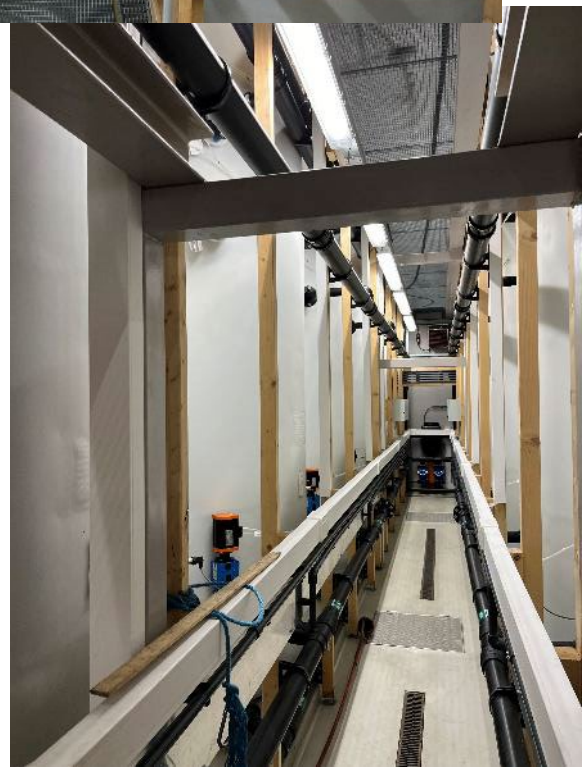
Primary treatment



Mechanical WWTP for 30 000 pe
Permit
SS: 60 mg/l or 50% and
BOD: 40 mg O_2/l or 20%

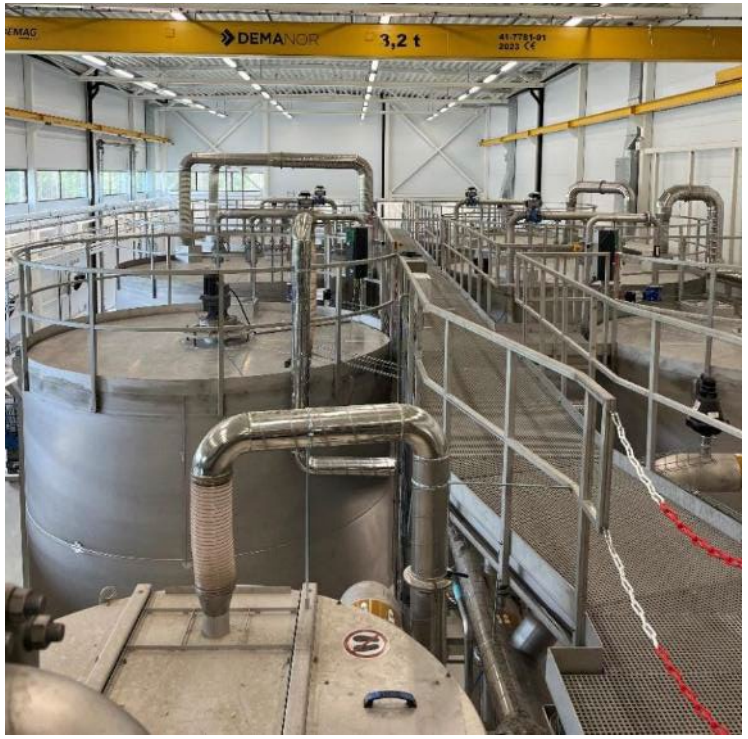
Secondary treatment - SBR





Biological-chemical WWTP with infiltration for 6000 pe
In the mountain: only cabins – no houses connected
WW to large tank in front of the WWTP for equalization
Permit: 90% P, 90% BOD, 75% COD

Secondary treatment – module based



Biological-chemical WWTP for 20 000 pe
1820 inhabitants, 4000 pe from cabins (14 000 pe in 2040)
2 separate treatment lines, 4 biological tanks with MBBR
Permit: 95% P, 70% BOD, 75% COD (also max. kg that can be discharged)

Secondary treatment – conventional WWTP

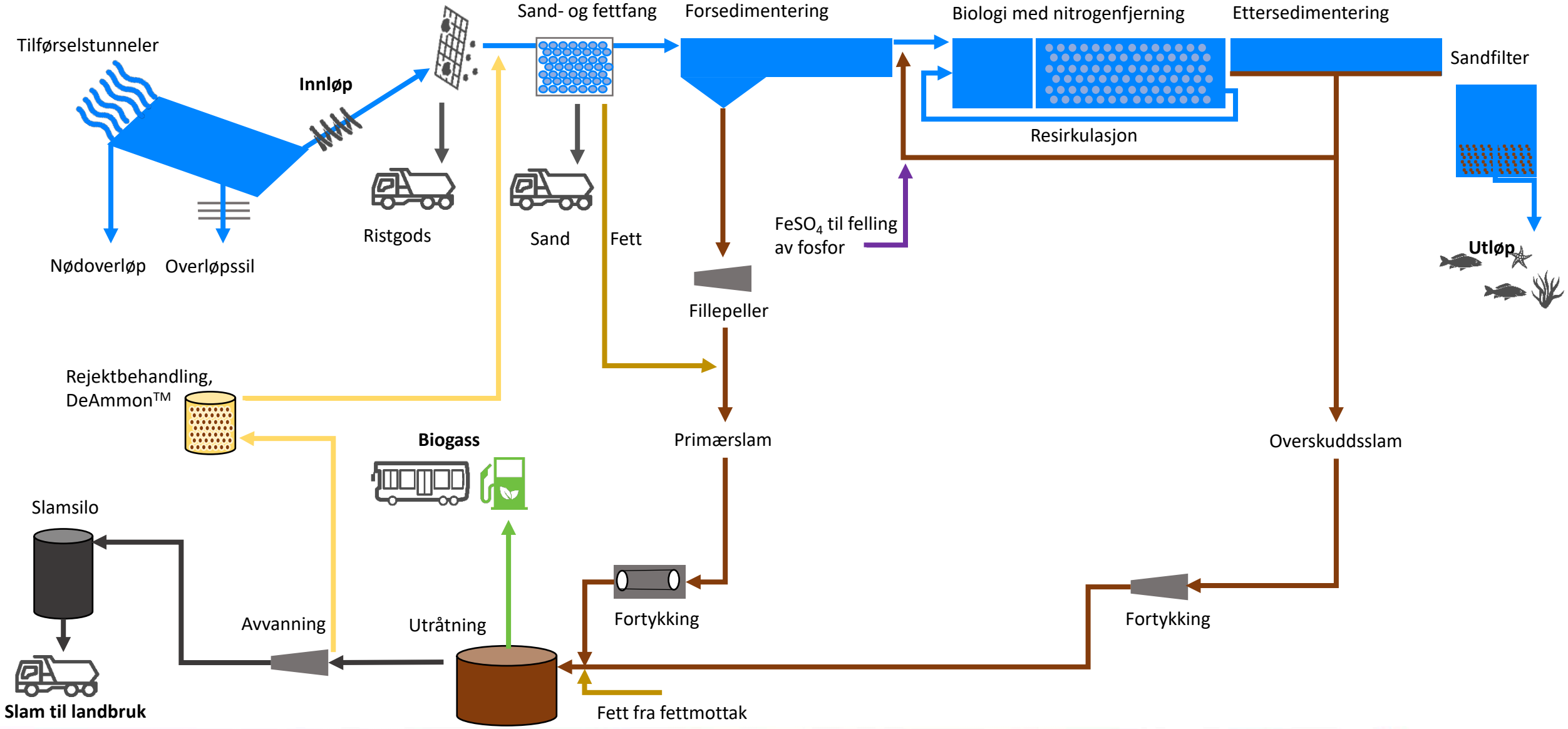
Biological-chemical WWTP for 30 000 pe
MBBR and sedimentation
Permit: 95% P, 70% BOD, 75% COD

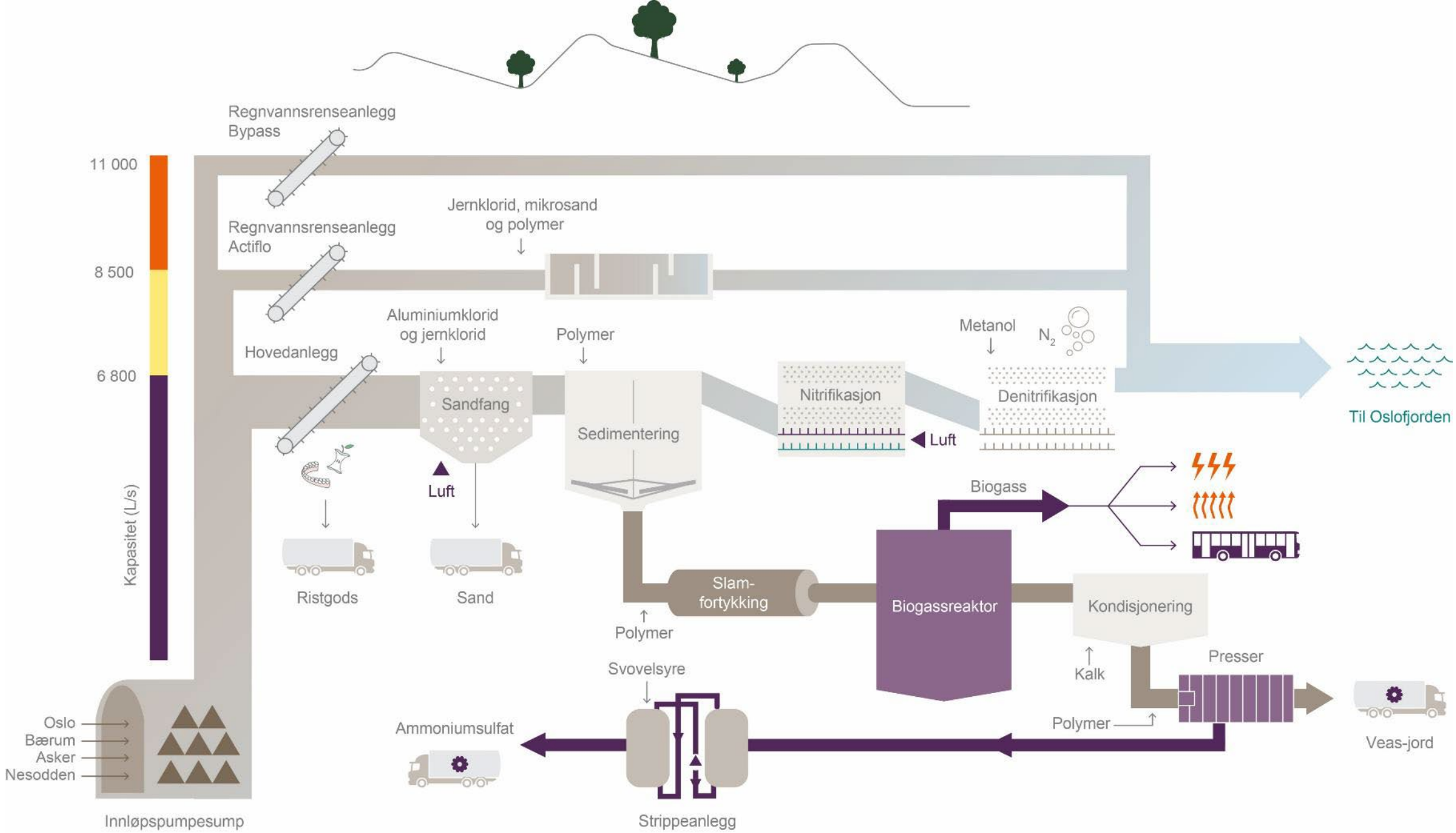
WWTP with nitrogen removal and sludge treatment

- Biological-chemical with N-removal
- 140 000 pe
- 25 mill m^3
- 25 000 tonnes sludge

Kilde: NRVA IKS

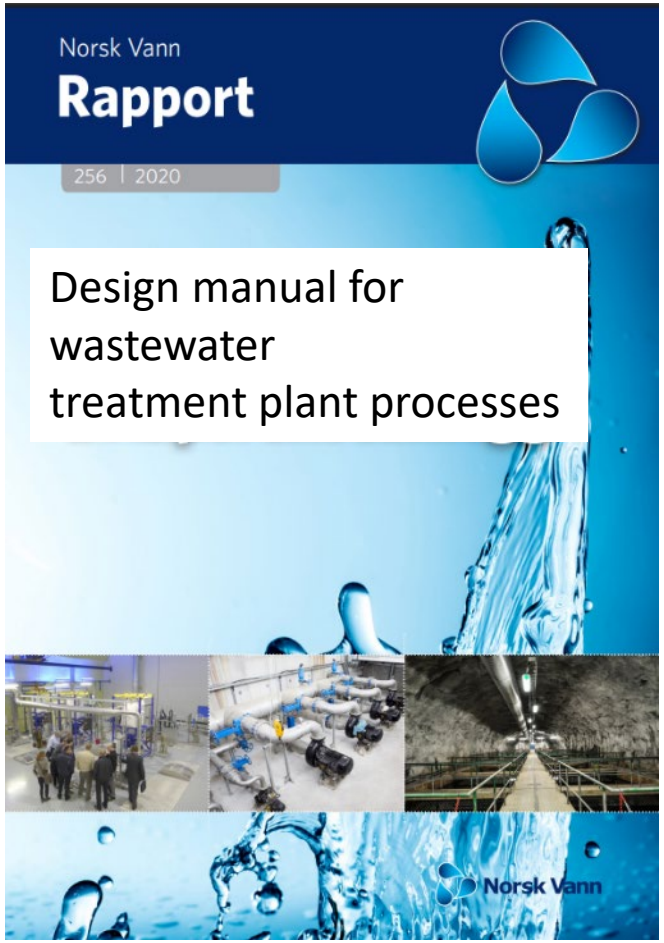
Flytskjema over Bekkelaget Renseanlegg




Regnvannsrenseanlegg
Bypass
11 000
Regnvannsrenseanlegg
Actiflo
8 500
Jernklorid, mikrosand
og polymer
Hovedanlegg
6 800
Aluminiumklorid
og jernklorid
Polymer
Sandfang
Sedimentering
Nitrifikasjon
Luft
Metanol
N_2
Denitrifikasjon
Til Oslofjorden
Kapasitet (L/s)
Luft
Ristgods
Sand
Biogass
Slam-
fortykking
Biogassreaktor
Kondisjonering
Polymer
Kalk
Presser
Svovelsyre
Ammoniumsulfat
Polymer
Veas-jord
Oslo
Bærum
Asker
Nesodden
Innløpspumpesump
Strippeanlegg

Useful reports

Can be downloaded from NorskVann.no



Checklist – design of wastewater treatment plants

	Hele prosjektet				
Punkt nr.	*Fokusområdet*	*Dette er inkludert*		*Ikke relevant*	*Kommentar*
		Konkurransegrunnlag	Gjennomføring		
0.01	Definert kommunikasjon/mediestrategi, samt kartlagt hvordan kommunikasjon skjer utad	☐	☐	☐	Avgjørende å etablere en overordnet kommunikasjonsstrategi tidlig i prosjektet, som både omfatter internt samarbeid og ekstern kommunikasjon. Må definere hvem som kan uttale seg på vegne av prosjektet, og hvordan informasjon skal deles internt for å sikre god informasjonsflyt og samarbeid.
0.02	Utarbeidet en realistisk og konkret fremdriftsplan, med tydelige milepæler og ansvarlige	☐	☐	☐	Utarbeide en oversikt over oppgaver, samt en kritisk linje for prosjektet.
0.03	Intern bemanning	☐	☐	☐	Behovet for interne ressurser endrer seg gjennom prosjektet og bør vurderes jevnlig. Det bør være klart hvem som skal inn når, og hvilket mandat og ansvar de har, slik at riktig kompetanse er tilgjengelig til rett tid. I tillegg til VA-teknisk kompetanse er det viktig å ha med innkjøpsfaglig og planfaglig kompetanse. Sikre involvering og dokumentasjon av verneombud, i tråd med kravene i arbeidsmiljøloven.
0.04	Etablert god forankring hos relevante aktører, samt hos (noen) sentrale politikere	☐	☐	☐	Prosjektet bør forankres tidlig, både i administrasjonen og hos sentrale politikere. Hold jevnlig kontakt og gi oppdatert informasjon. Vurder om tiltak krever behandling i politiske utvalg før oppstart. Beslutninger og vurderinger bør dokumenteres godt.
0.05	Lagt til rette for en eventuell innovasjonsprosess	☐	☐	☐	Kan gjøres på ulike tidspunkt i tidligfasen.

Contact information:

- elisabeth.lyngstad@norskvann.no
- johanne.marie.olaussen@ks.no