EnviDan

SustainED

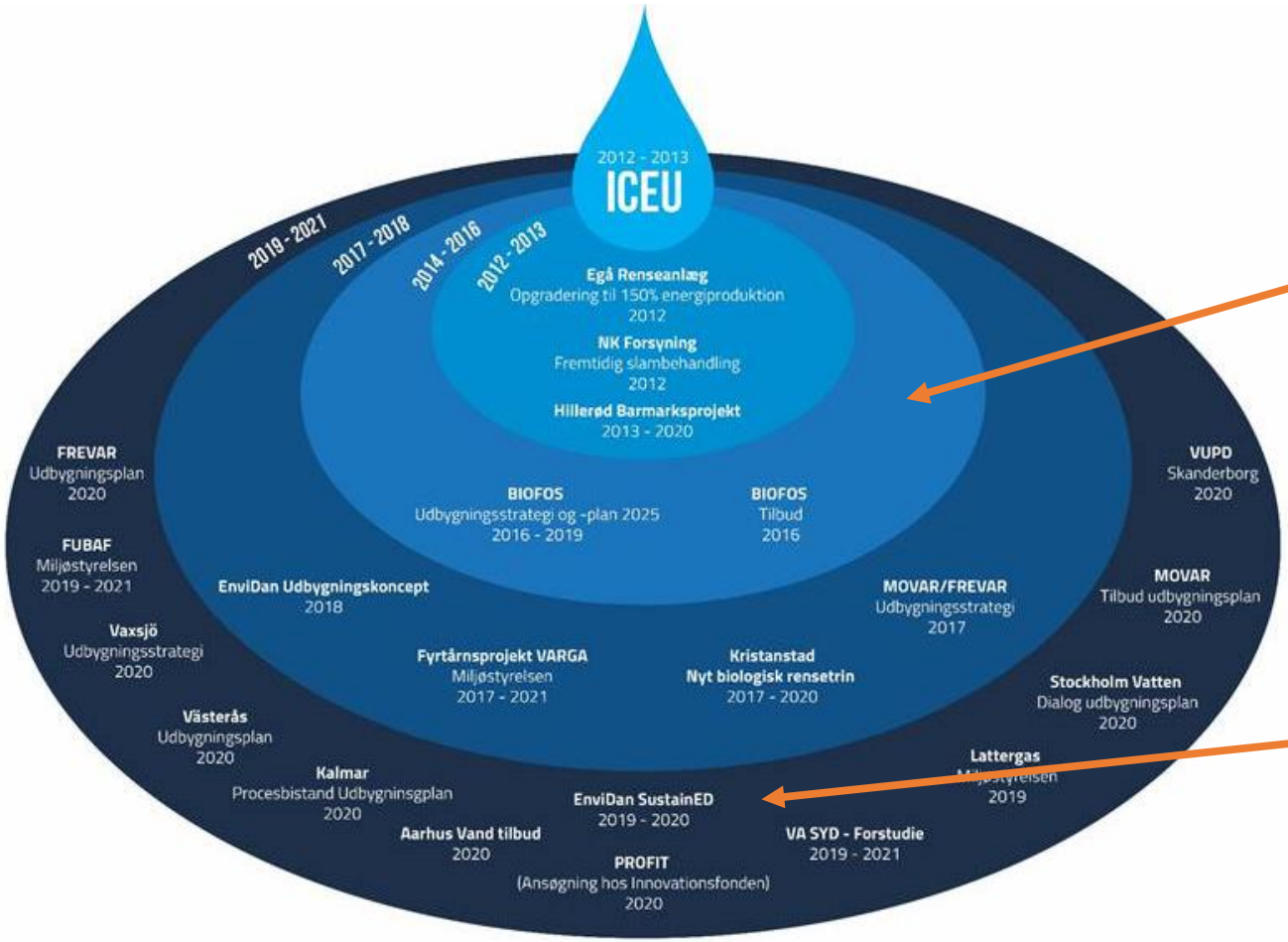
Metode til at planlægge bæredygtighed i vandsektoren og praktiske erfaringer

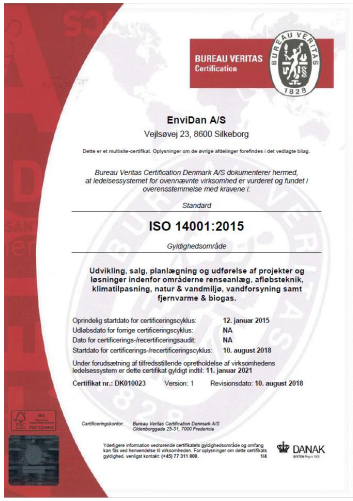
DANVA Bæredygtighed i vandsektoren

Jeanette Agertved Madsen

Udviklingschef, EnviDan A/S

Fra R&D til miljøledelse & SustainEd





BUREAU VERITAS
Certification

EnviDan A/S
Vejlsøvej 23, 8600 Silkeborg

Dette er et multisite-certifikat. Oplysninger om de øvrige afdelinger forefindes i det vedlagte bilag.

Bureau Veritas Certification Denmark A/S dokumenterer hermed, at ledelsessystemet for ovennævnte virksomhed er vurderet og fundet i overensstemmelse med kravene i:

Standard

ISO 14001:2015

Gyldighedsområde

Udvikling, salg, planlægning og udførelse af projekter og løsninger indenfor områderne renseanlæg, afløbsteknik, klimatilpasning, natur & vandmiljø, vandforsyning samt fjernvarme & biogas.

Oprindelig startdato for certificeringscyklus:	**12. januar 2015**
Udløbsdato for forrige certificeringscyklus:	**NA**
Dato for certificerings-/recertificeringsaudit:	**NA**
Startdato for certificerings-/recertificeringscyklus:	**10. august 2018**

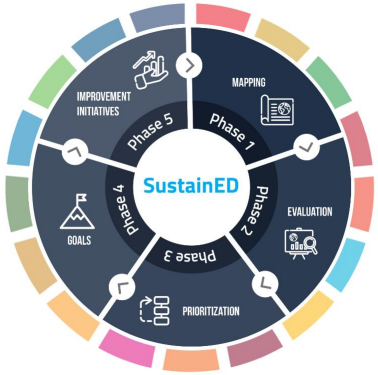
Under forudsætning af tilfredsstillende opretholdelse af virksomhedens ledelsessystem er dette certifikat gyldigt indtil: **11. januar 2021**

Certifikat nr.: DK010023 Version: 1 Revisionsdato: **10. august 2018**

Certificeringsenhed: *Bureau Veritas Certification Denmark A/S*
Oldenborggade 25-31, 7000 Fredericia

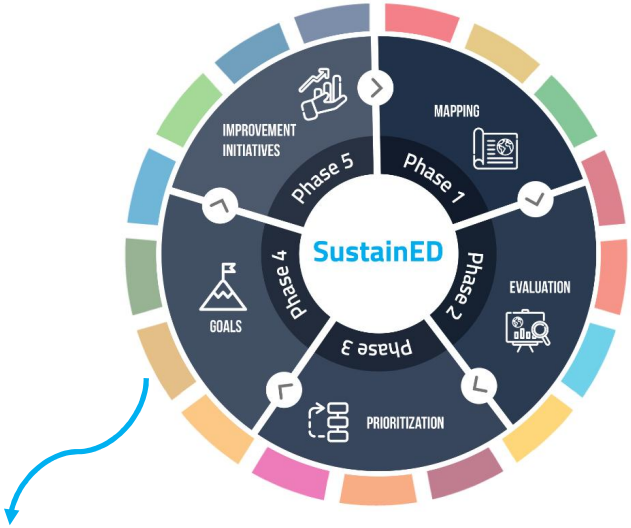
Yderligere information vedrørende certifikatets gyldighedsområde og omfang, kan fås ved henvendelse til virksomheden. For oplysninger om dette certifikats gyldighed, venligst kontakt: (+45) 77 311 906.

DANAK

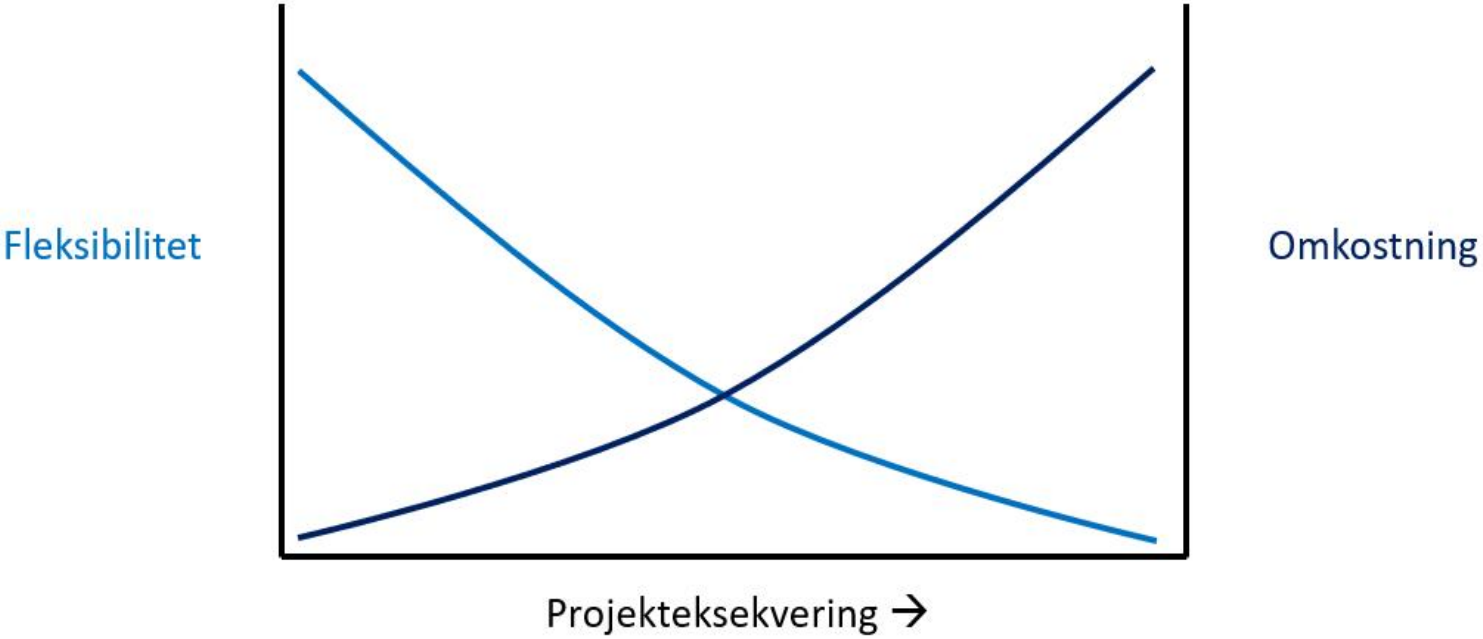


Udbygningsplan

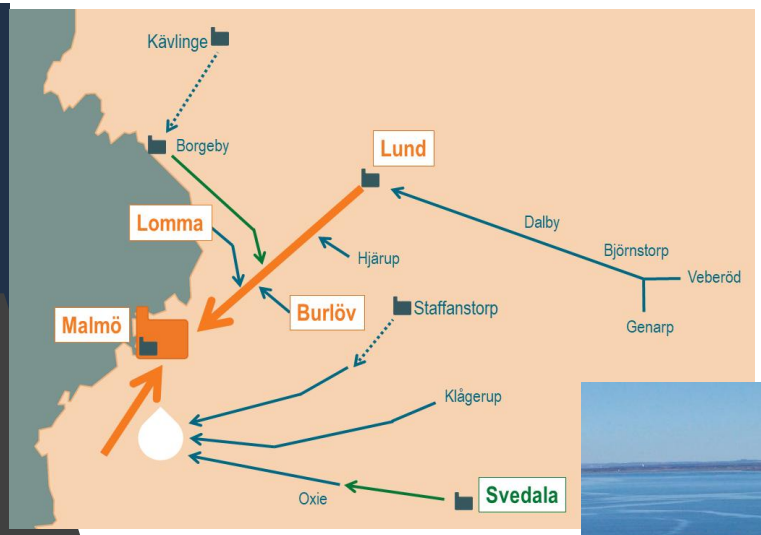
BIOFOS udbygningsplan 2025 (DK)
MOVAR/FREVAR (NO)
VA SYD (SE)
Skanderborg (DK)
Fredensborg (DK)
Västerås Vaxjö (SE)
ReWater (DK)
NRA (SE)



Projekteksekvering



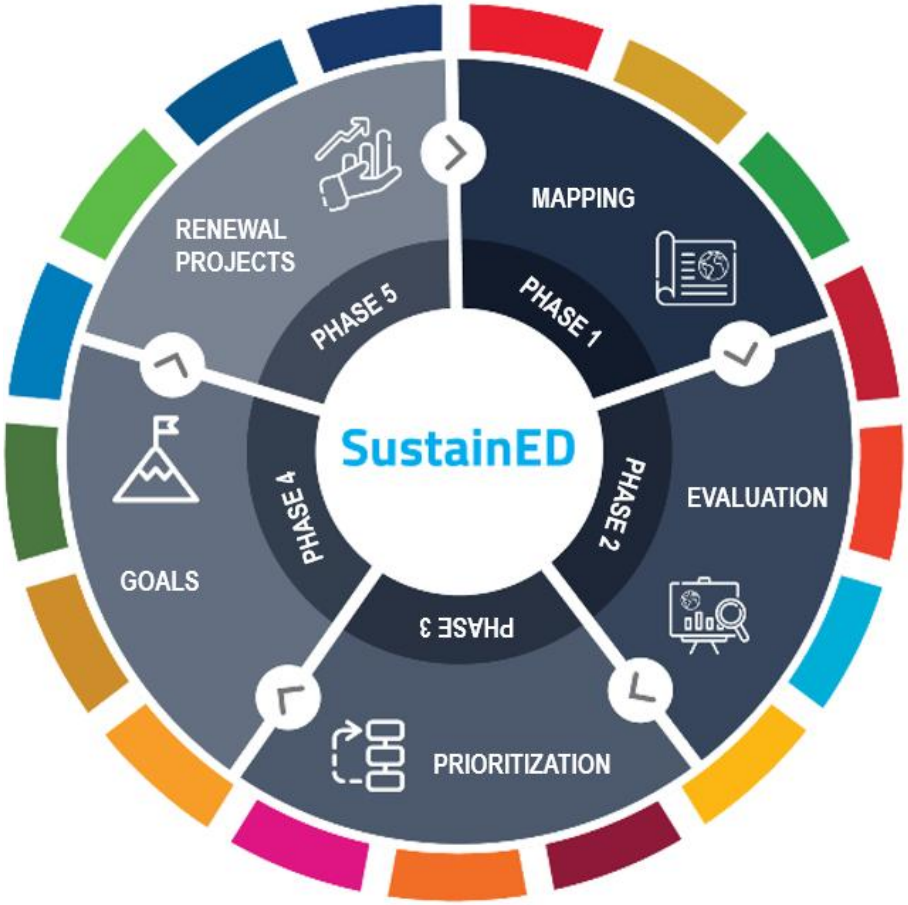
Eksempel

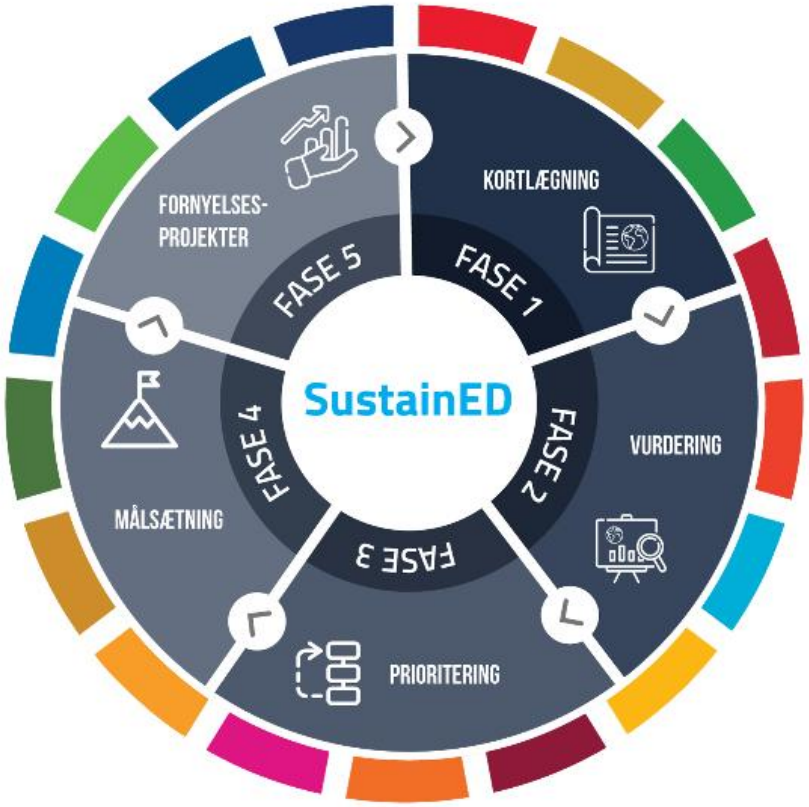

Kävlinge
Borgeby
Lund
Lomma
Dalby
Hjärup
Björnstorp
Veberöd
Malmö
Burlöv
Staffanstorp
Genarp
Klågerup
Oxie
Svedala

Sjölunda 350 -> 800.000 PE

VA SYDs Strategiske mål

- Vara klimatneutralt och energipositivt år 2030
- Produktifiera och nyttiggjort restprodukter år 2025
- Vara en av Europas 10 mest effektiva VA- och avfalls-organisationer år 2025
- Leda utvecklingen för hög vattenkvalitet till rekreation och dricksvatten år 2025
- Uppnå nollvision för oplanerade driftstörningar för kund år 2030
- Inspirera och ha aktiverat alla kunder för en bättre miljö år 2025





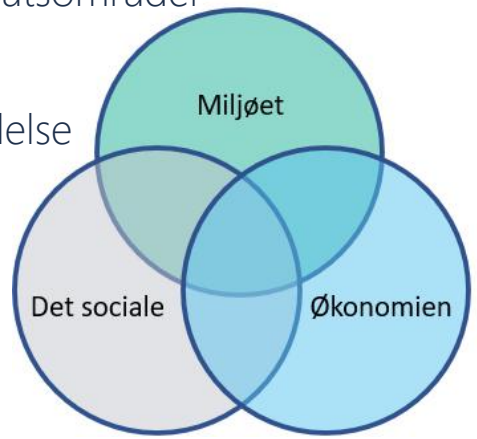
Kortlægning → Dataindsamling og visualisering af baseline

Vurdering → Databehandling, analyse og vurdering af potentialer

Prioritering → Udvælgelse af indsatsområder

Målsætning → Definere konkrete mål for indsatsområder

Fornyelsesprojekter → Løsninger til målopfyldelse



SustainEd Fase 1: Kortlægning

Livscyklusfase

Systemafgrænsning

Referenceår

Ressourceforbrug

Emission til omgivelserne

Produkter

SustainEd Fase 2: Vurdering

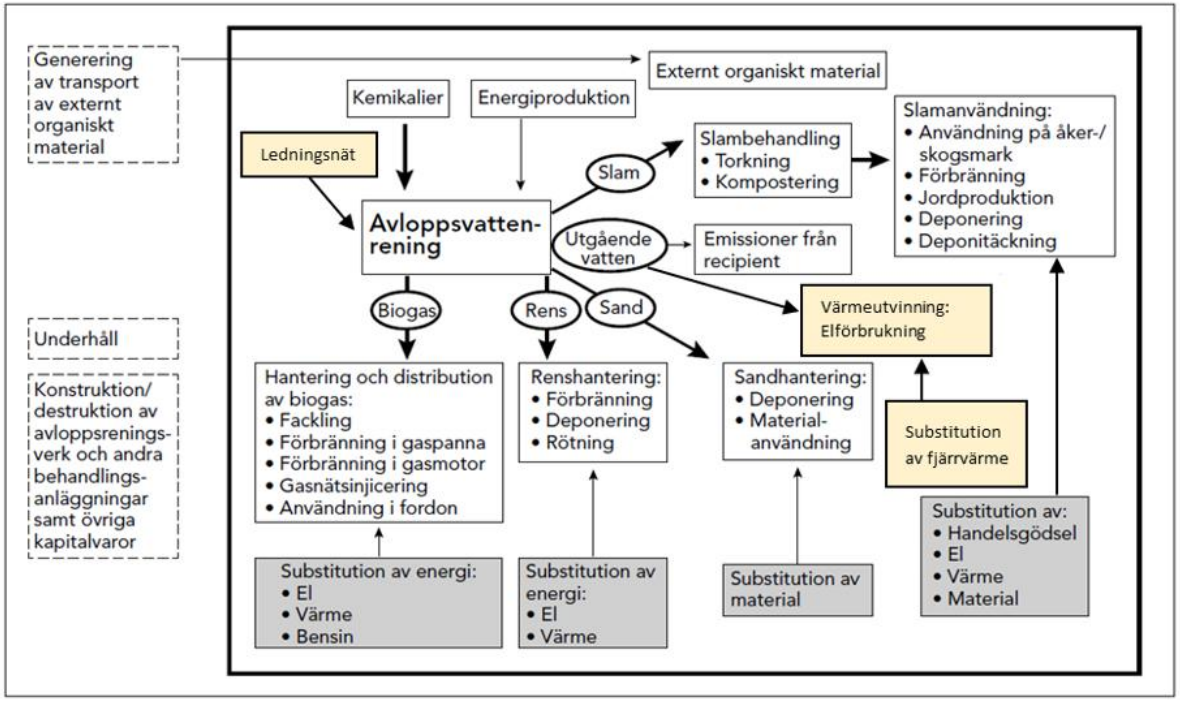
Potentialer for reduktion af:

Miljøpåvirkninger & effekter

Ressourcegenvinding

Symbioser

Sammenligning med branchespecifikke nøgletal



SustainEd Fase 3: Prioritering

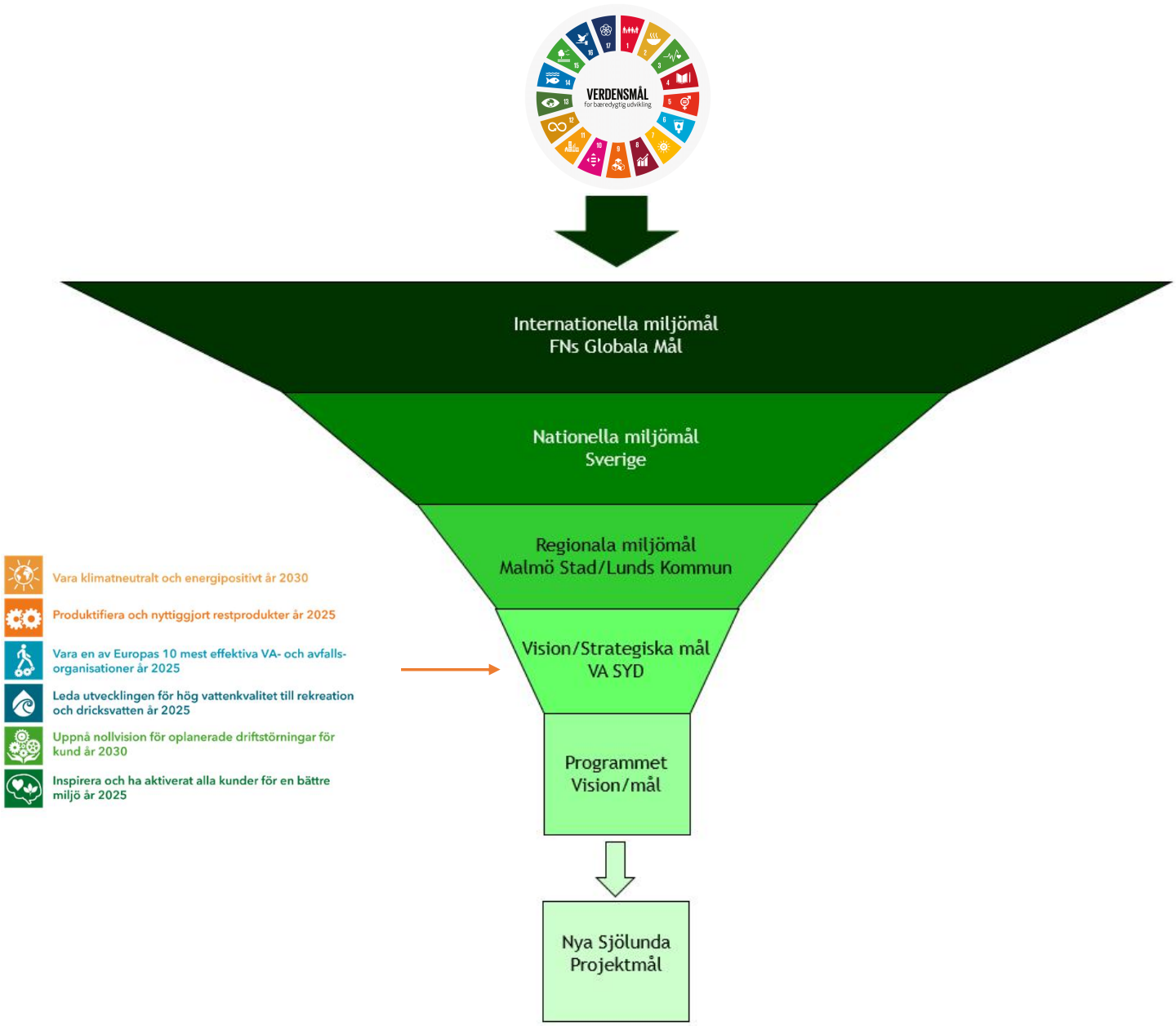
Potentialer

Kundekrav

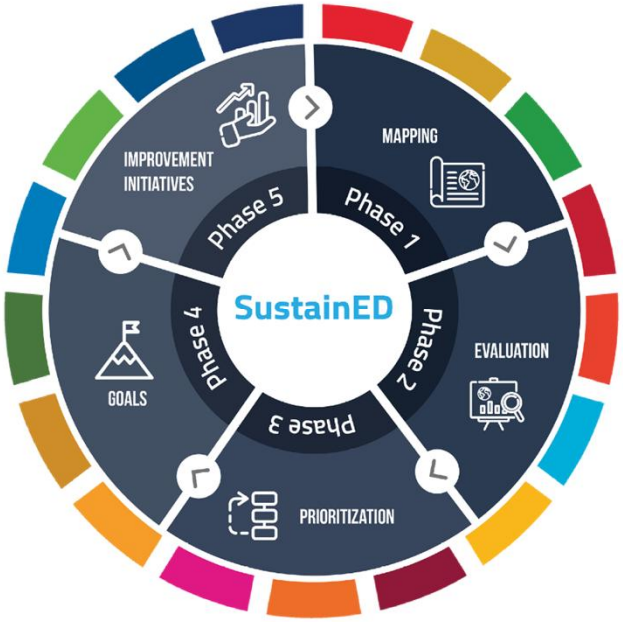
Eksterne forventninger

SustainED Fase 4:

Målsætning



SDGPriority – et hjælpeværktøj



SDGPRIORITY
-A part of SustainED

https://sdgpriority.azurewebsites.net/

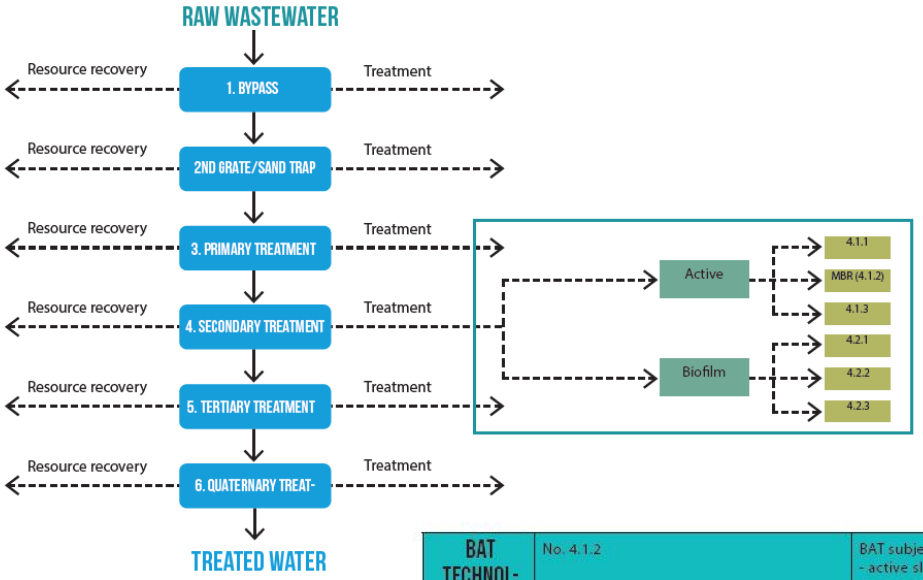
Eksempel: Projektmål

- Vara klimatneutralt och energipositivt år 2030
- Produktifiera och nyttiggjort restprodukter år 2025
- Vara en av Europas 10 mest effektiva VA- och avfalls-organisationer år 2025
- Leda utvecklingen för hög vattenkvalitet till rekreation och dricksvatten år 2025
- Uppnå nollvision för oplanerade driftstörningar för kund år 2030
- Inspirera och ha aktiverat alla kunder för en bättre miljö år 2025

→ Konkrete projektmål pr. strategisk mål

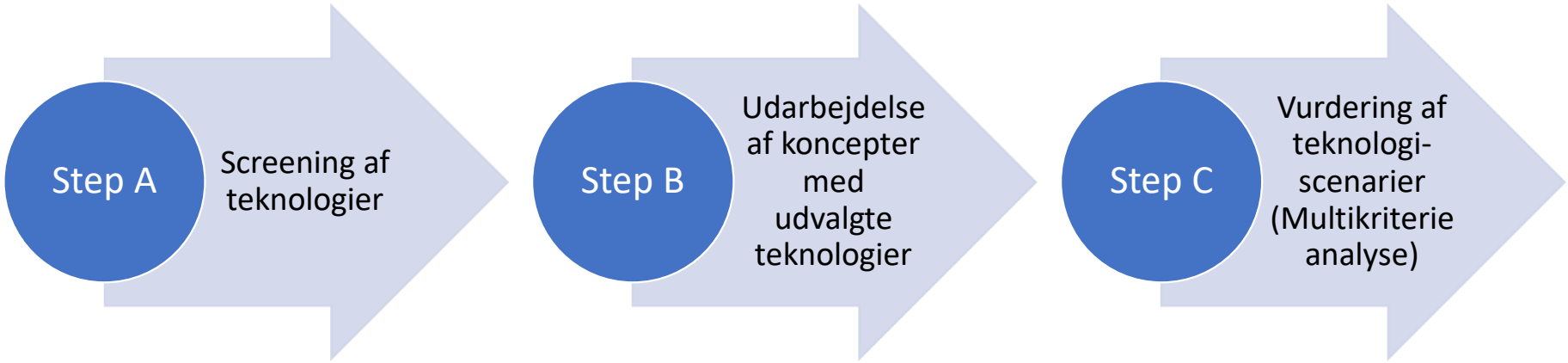
SustainED Fase 5:

Fornyelsesprojekter

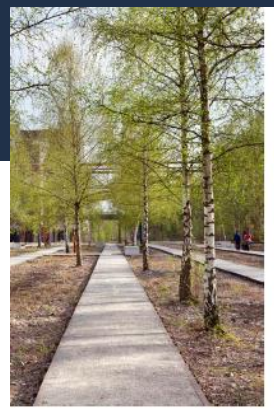


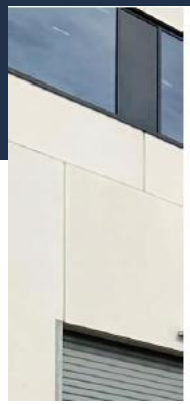
BAT TECHNOL-OGY	No. 4.1.2	BAT subject: secondary treatment - active sludge Title: Membrane reactor (MBR)	Date: XX.XX 20XX Version: Example
Resource and environmental	Resource: Area-effective method for increasing the treatment capacity. Environmental impact: Reduction of emissions to the water.		
Purpose	The expansion of capacity via an increased content of active sludge in the aeration tank and the withholding of active sludge in process tanks with mem-		
Description of technology	The membrane filtration allows for a higher concentration of sludge in the process tanks (8-15 kg SS/ m^3) compared to what is typically allowed in an active sludge plant, and this results in an expansion of capacity. Treated water is separated from active sludge via filtration through membranes with a pore size of 0.2 um. The membrane allows for water, but not particles, to pass through it and this allows for a very clean discharge. In order to keep the membranes clean, they require a continual cleaning, for exam-		Alfa Laval hollow skeet membrane cassette (image from Alfa LAval) and GE ZeeWeed hollow-fibre mem-branes (image from
Advantages and disadvan-tages	Advantages: A compact plant expansion. In principle, particle-free water is emitted. Can improve the break-ing down of positive environmental substances and filter out bacteria and viruses. Allows for the reuse of treated wastewater for various purposes.	Disadvantages: It is a very complicated process with a lot of machine installations. Keeping the membranes clean require quite a bit of energy and chemicals to be used. In some cases, pumps may be needed to achieve sufficient pressure drops over the membranes. In some cases, it may require the installation of fine grates (1 mm hollow grates) prior to the biological process.	
Technological maturity/ References/ Technology	Maturity: MBR technologies are mature with many full scale installations around the world.	References: Renseanlæg Mølleåværket (DK) + Henriksdal (SE) (under construction) + Kristianstad ARV (SE)	Technology radar: Complexity: High Business potential: Limited Strategic impact: Medium
Implementa-bility and effi-ciency	Implementability: The technologies can presumably be set up immediately.		Efficiency: A very effective particle savings and documented good outflow concentrations on all parameters in general.
Financial key figures	Investment costs: The technologies typically do not require investments in new tank volume, but they do require large investments in machinery and electrical equipment. DKK 10-15 million / 1,000 m^3/hour		Operating costs: Chemicals are needed for the periodic cleaning of membranes, and a continual cleaning of the membranes via aera-
Flexibility and scalability	Flexibility: Low level of flexibility on the membrane filtration itself. Can for example clean fixed sub-flows for the biological step.		Scalability: Can be built in any size that is relevant for Aarhus ReWater.
Working envi-ronment and	Working environment: Management of cleaning chemicals		Special considerations:

Fra teknologier til koncepter



Eksempel: Multikriterieanalyse og GAP-analyse





Næste skridt

Bæredygtighed Miljø

- Klimaneutral
- Energi 125 procent
- 100% selvforsynende med process vand
- Fjernelse af miljøfremmede stoffer
- Resource udnyttelse – sand, termisk energi, køling, vand til genanvendelse, biogas

VASYD sustainable wastewater treatment EnviDan

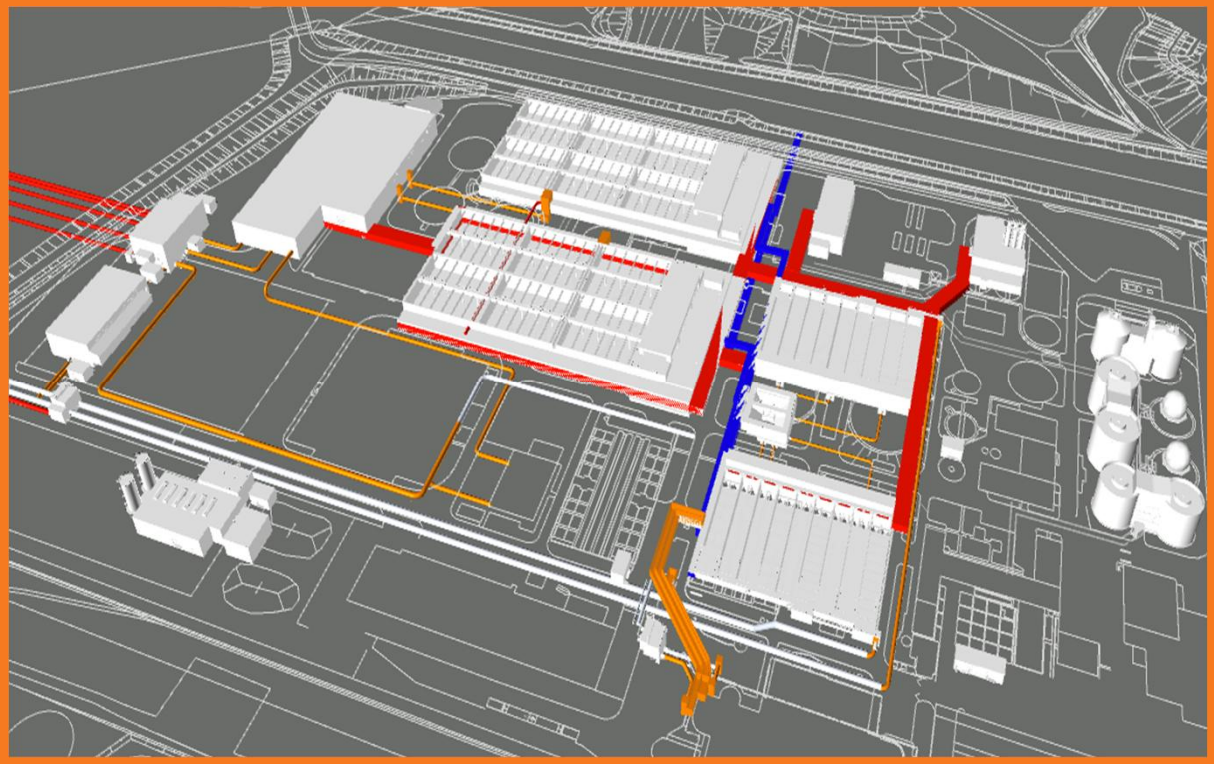
Social bæredygtighed

- Sikker og attraktiv arbejdsplads
- Tiltrække besøgende og borgere gennem et inspirerende miljø
- Skabe opmærksomhed og uddannelsesmuligheder indenfor spildevandsrensning
- Besøgscenter og testfaciliter

VASYD sustainable wastewater treatment EnviDan

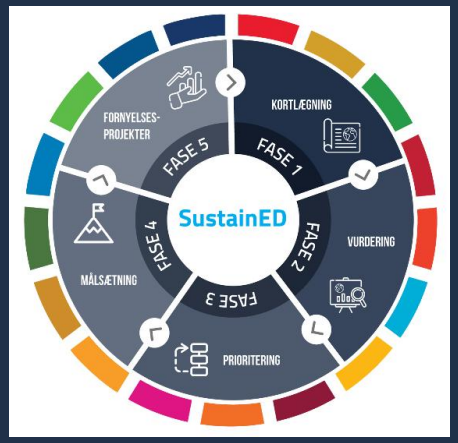
Økonomisk bæredygtigt

- Attraktivt at tilslutte sig renseanlægget
- Fleksibelt design - fremtidige teknologier og udbygning
- Centralisering af special kompetencer på et sted
- Testfaciliteter - optimering og samarbejde



EnviDan VASYD sustainable wastewater treatment

Tak for opmærksomheden



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