

BIOFOS

BIOFOS

BIOFOS is the largest wastewater utility in Denmark. We treat the wastewater of 1.2 million people living in the Greater Copenhagen Area at our three treatment plants Lynetten, Avedøre and Damhusåen.

We use the resources contained in the wastewater for climate-friendly energy in the form of electricity, biogas and district heating for the grid.

BIOFOS also operates an active visitor service, which receives more than 12,000 visitors a year.



Vision

We want to be the most efficient in our field at handling wastewater and extracting resources

We want to be technologically advanced and have the most attractive competence environment





Benchmarks for 2025

The benchmarks are highly ambitious, and, in the period from 2015–2020, we will create the conditions to ensure that the four benchmarks can realistically be achieved by 2025:

- All residual products from our core processes will be recycled or made use of from 2025
- BIOFOS as a whole is carbon neutral by 2025
- BIOFOS as a whole is energy producing, net, by 2025
- All planning, coordination, management and operation of rain and wastewater management is considered as one cohesive system throughout the entire BIOFOS catchment area by 2025







DESTINATION

PLAY

What are the best cities for swimming?

Joe Minihane, for CNN • Updated 28th May 2018

1. Copenhagen, Denmark

A city surrounded by water, Copenhagen is a joy for swimmers, especially as midsummer looms and winter becomes a distant memory.

<u>Amager Beach Park</u> is an ideal sandy spot for whiling away an afternoon. It's a twokilometer artificial island that creates a calm lagoon perfect for a paddle.

If leaving the city seems like a chore, the sensational harbor baths at Islands Brygge and Fisketorvet are a winning alternative. Daredevils can try out the diving boards while fitness fanatics can plow out laps in the clean, cool water.

Amager Strandpark, Amager Strandvej, Copenhagen 2300 Denmark;

2. Zurich, Switzerland

Switzerland's love affair with diving into rivers and lakes isn't just confined to the High Alps. Zurich has 18 official outdoor bathing spots, all offering crystal-clear water in stunning surroundings.

Tiefenbrunnen swimming beach, on the shores of Lake Zurich, is the big draw thanks to its kids' pool, diving boards and the chance to get a post-swim massage.

For something off the beaten track, men can try the Schanzengraben river pool, which dates back to 1864. The women-only <u>Stadthausqual</u> pool is an art nouveau gem with views of the old town.

Frauenbad Stadthausquai, Stadthausquai 13, Zurich Switzerland; Strandbad Tiefenbrunnen, Bellerivestrasse 200, Zurich 8008 Switzerland;

3. London, England





Islands brygge harbour bath





Our treatment plants in BIOFOS



Treatment plant Lynetten 1. Mio PE; Sludge digestion and incineration



Treatment plant Avedøre 400.000 PE; Sludge digestion and incineration



Treatment plant Damhusåen 350.000 PE; Sludge digestion, photo-voltaic power station



BIOFOS' catchment area





Key figures 2016: Economy, production and sales

KEY FIGURES 2016

Economy	(DKK 1,000)
Turnover	506,004
Gross result	50,163
Financial items	-5,461
Net profit	19,917
Investments	166,603

Production and sales

Treated wastewater, million m ³	115
Sale of district heating, MWh	40,081
Sale of electricity, MWh	10,955
Sale of biogas, Nm ³	5,945,832





Key figures 2016: Resource consumption and residual products



KEY FIGURES 2016

Resource consumption	
Electricity, MWh	49,534
District heating, MWh	3,482
Drinking water, m ³	46,326
Ferric chloride, ton	3,307
Lye, ton	721
Polymers, ton	273
Residual products	
Ash, ton	7,648
Sand, ton	1,102
Screenings, ton	1,723



Treatment quality, 2017



Treatment quality				\bigcirc
WWTP	Lynetten	Avedøre	Damhusåen	Effluent standard
BOD, mg/l	2,30	2,10	3,10	15,0
COD, mg/l	28,00	23,80	26,00	75,0
Total N, mg/l	4,00	4,40	5,00	8,0
Total P, mg/l	0,33	0,44	0,44	1,5



Sludge incineration



TREATMENT PLANT, TON (dry solids)	Lynetten	Avedøre	Damhusåen	Total
Sludge produced	10,175	4,873	4,656	19,704
Sludge transferred to other plants	727	-	4,656	5,383
Sludge supplied				
 From the Lynetten treatment plant 	-	727	-	727
 From the Damhusåen treatment plant 	4,356	300	-	4,656
 From wastewater utilities 	689	1,518	-	2,207
Incinerated sludge	14,493	7,418	-	21,911



Why has BIOFOS chosen incineration?

History: Zink, lead and copper in the wastewater from roads, roofs and pipes **Transport**: Avoid transport of sludge through Copenhagen; large distance to suitable agriculture land **Operational**: Storage for 9 months **Security of handling**: Have to be able to handle without accept from agriculture Energy: Exportable heat produced **CO₂:** Improved balance **Economy**: Marginal price competitive with agriculture **Environment:** Micro plastic and other micro pollutants disappear with incineration





Waste as a ressource – Circular Economy



Water !

Energy

- Gas, Electricity, Heat
- Nutrients
- Organic building blocks
 - Monomers

Metals



Sale of energy





Energy balance 2017 - BIOFOS





Energy balance for 2017 – WWTP Lynetten





Our Target: BIOFOS as a whole is carbon neutral by 2025



Focus on energy optimisation

Conversion of biological aeration tanks from surface rotors to bottom aeration

> Approx. 57% reduction in electricity consumption for aeration



Photovoltaic power station, the Damhusåen treatment plant





Visitor service/KloakLab (sewage lab)



We help educate residents and companies about sustainable aquatic environments and wastewater resources

- Primary Schools, upper secondary schools and colleges as well as vocational training colleges
- Associations and interest groups
- Industry-related education programmes (Technical University of Denmark (DTU), University of Copenhagen, The Copenhagen School of Marine Engineering and Technology Management, laboratory technician training, etc.)
- Municipalities, utilities, our industry
- VIP visits, including foreign delegations





BIOFOS

Department of development

Objectives

- Evaluate and introduce new technologies or methods
- Improve the ability to comply with future regulatory demands
- Contribute to technology development in the sector
- Knowledge sharing and "scouting"

Development and Innovation projects - main implementation mechanism





Focus areas



Development projects



BIOFOS



Automation

Control levels



BIOFOS Living Lab

Laboratory and pilot scale testing of new Technologies prior to full scale implementation

Newly established site for pilot tests with access to water and sludge from different steps in the treatment process

Tests presently going on

- VARGA one test facility
- CLEANWATER three test facilities

New flexible ATEX secured pilot Container planned





Implementation process in the Development department







BIOFOS

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