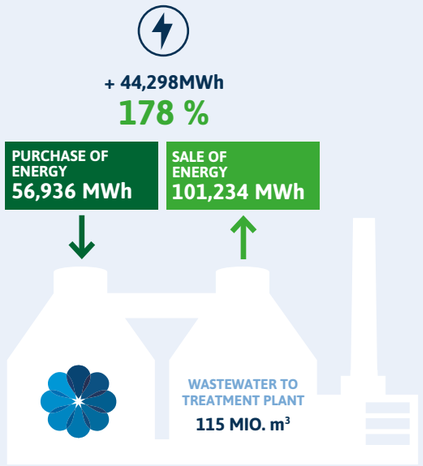
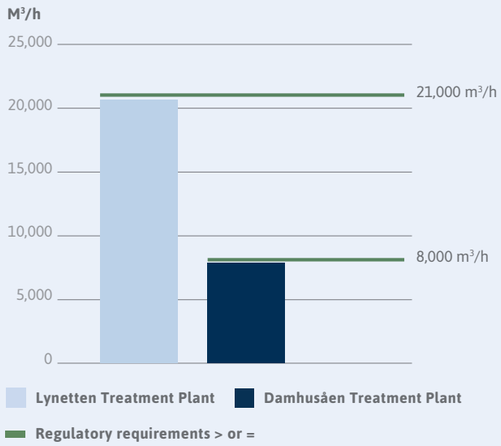
Environment, climate and supply

BIOFOS energy balance 2021



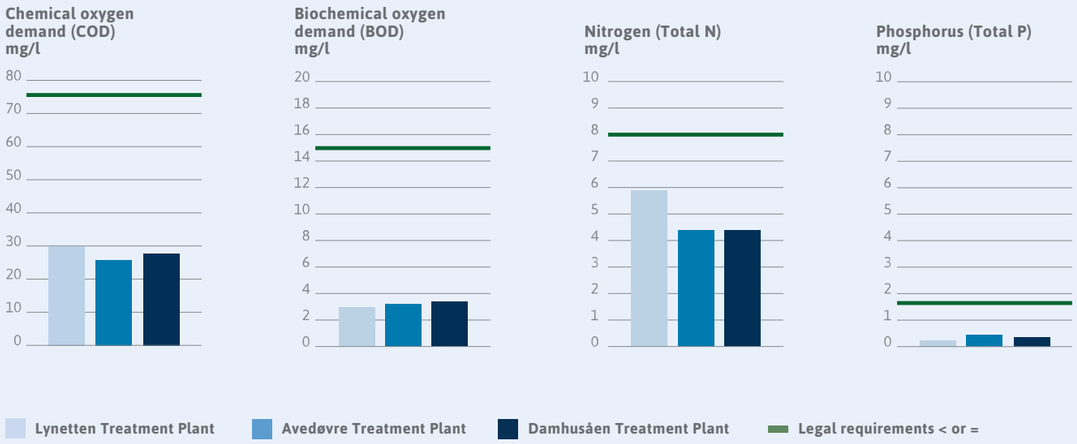
Biological capacity 2021

Average biological capacity over the year



Quality of treated wastewater

Result 2021 versus legal requirements



BIOFOS is the largest wastewater company in Denmark. We treat the wastewater of 1.2 million inhabitants in the Greater Copenhagen area at our three plants Lynetten, Avedøre and Damhusåen.

We use the resources in the wastewater to produce climate friendly energy in the form of electricity, biogas and district heating for the supply network.

BIOFOS also has an active school service, where school children recieves education in wastewater, environment and sustainable energy.

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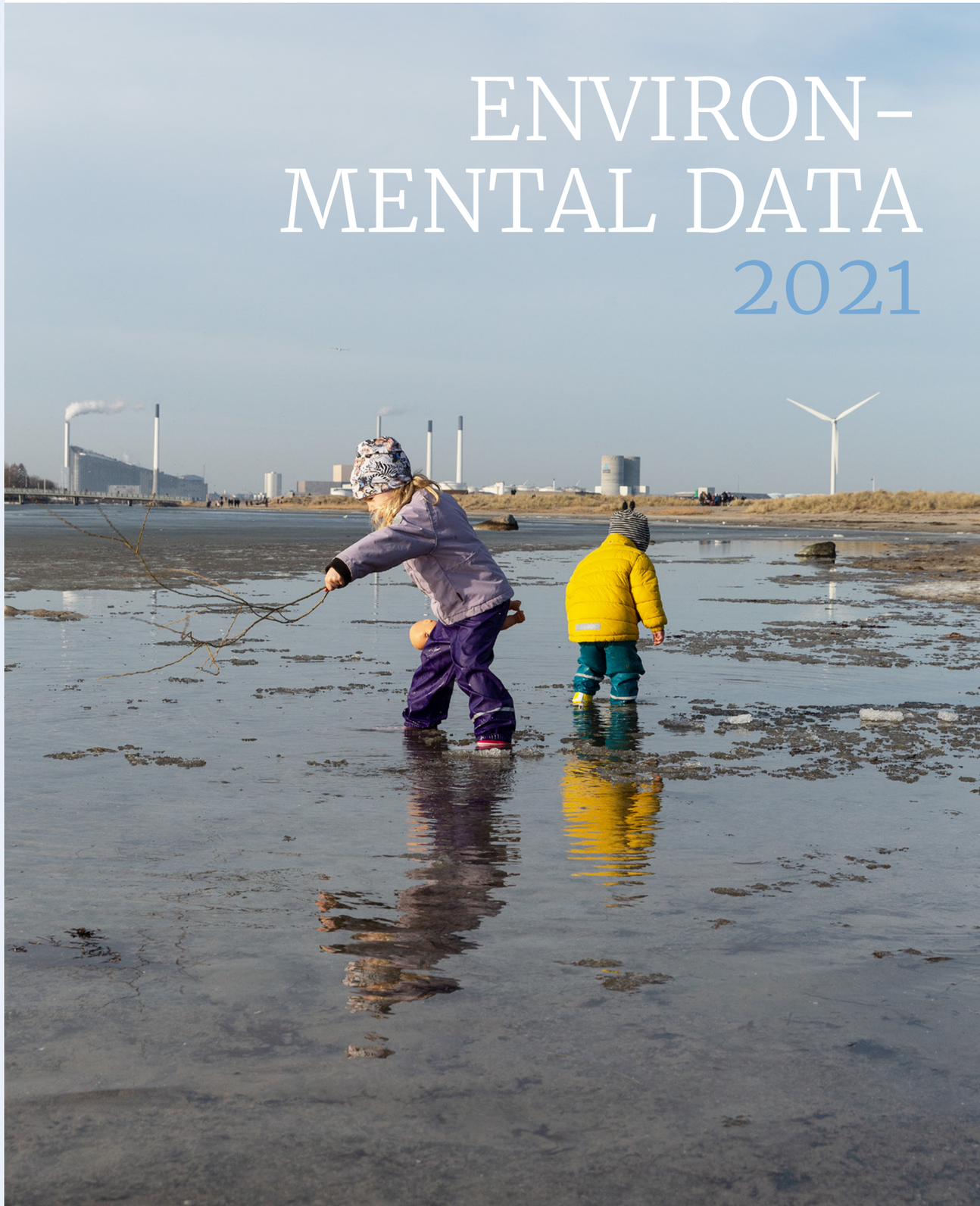
BIOFOS

ENVIRON-MENTAL DATA 2021



WASTEWATER TREATMENT

INCOMING FLOWS	UNIT	WWTP LYNETTEN	WWTP AVEDØRE	WWTP DAMHUSÅEN	TOTAL	DATA IS DETERMINED BY
Wastewater						
Volume of water	mill. m^3/year	60.4	23.6	30.8	114.8	M
Organic matter in wastewater						
COD	t/year	39,538	19,742	19,335	78,615	C
Nutrients in wastewater						
Phosphorus	t/year	420	197	197	814	C
Nitrogen	t/year	3,243	1,405	1,472	6,120	C
Suspended solids	t/year	20,594	9,957	13,108	43,659	C
OUTGOING FLOWS						
Organic matter in treated wastewater						
COD	t/year	2,152	669	748	3,569	C
Nutrients in treated wastewater						
Phosphorus	t/year	28	15	12	55	C
Nitrogen	t/year	438	156	170	764	C
Suspended solids	t/year	700	151	222	1,073	C
Bypassed mechanical treated wastewater						
Volume[1]	mill. m^3/year	1.75	0.17	2.41	4.33	M
Organic matter in mechanically treated wastewater						
COD	t/year	857	32	650	1,539	C
Nutrients in mechanically treated wastewater						
Phosphorus	t/year	9	1	8	18	C
Nitrogen	t/year	63	3	51	117	C
Suspended solids	t/year	518	23	415	956	C

[1] Without precipitation adjustment

SLUDGE TREATMENT

	UNIT	WWTP LYNETTEN	WWTP AVEDØRE	WWTP DAMHUSÅEN	TOTAL	DATA IS DETERMINED BY
Own production of sludge	t DM/year	11,308	5,104	5,701	22,113	C
Sludge transported to other WWTP	t DM/year	572	-	5,068	5,640	C
Sludge transported to agricultural land	t DM/year	-	5	633	638	C
Sludge from other WWTP						
From WWTP Lynetten	t DM/year	-	572	-	572	C
From WWTP Damhusåen	t DM/year	4,039	1,029	-	5,068	C
From other wastewater utilities	t DM/year	237	866	-	1,103	C
Total incinerated sludge	t DM/year	15,012	7,566	-	22,578	C

FLUE GAS FROM INCINERATOR

OUTGOING FLOWS	UNIT	WWTP LYNETTEN	WWTP AVEDØRE	WWTP DAMHUSÅEN	TOTAL	DATA IS DETERMINED BY
Quantity of flue gas	mill. Nm^3/year	123	52	-	175	C
Carbon monoxide	t/year	0.33	0.24	-	0.57	C
Carbon dioxide	t/year	11,514	7,587	-	19,101	C
Sulphur dioxide	kg/year	10	604	-	614	C
Particles	kg/year	58	34.2	-	92.2	C
Hydrochloric acid	kg/year	149	28	-	177	C
Ammonia	kg/year	188	161	-	349	C
Nitrogen oxides	kg/year	3,274	2,968	-	6,242	C
Dioxin	mg/year	0.11	0.04	-	0.15	C
TOC	kg/year	11.0	-	-	11.0	C

ENERGY

CONSUMPTION	UNIT	WWTP LYNETTEN	WWTP AVEDØRE	WWTP DAMHUSÅEN	TOTAL	DATA IS DETERMINED BY
Electricity	Mwh/year	28,430	11,805	9,881	50,116	M
Heat	Mwh/year	196	4,229	330	4,755	M
Fuel oil	m^3/year	7	8	-	15	M
PRODUCTION						
Heat[2]	Mwh/year	39,623	6,633	-	46,256	M
Hereof from flue gas	Mwh/year	12,970			12,970	M
Biogas – own production	Nm^3/year	8,798,375	4,211,970	3,102,517	16,112,862	M
Electricity from solar cells	Mwh/year	-	-	648	648	M
Electricity from biogas engine	Mwh/year	-	1,078	3,543	4,621	M
SALE AND OUTGOING FLOWS						
Sale of district heating	Mwh/year	36,726	1,271	3,608	41,605	M
Sale of electricity	Mwh/year	-	1,078	3,543	4,621	M
Sale of biogas	Nm^3/year	5,205,405	2,376,633	-	7,582,038	M
Emission of biogas	Nm^3/year	3,130	758	400	4,288	C
Biogas for torch	Nm^3/year	80,319	24,111	160,421	264,851	C

[2] WWTP Lynetten = heat water exchanger + boiler + exported heat to district heating system from incinerator
WWTP Avedøre = biogas motor + exported heat to district heating system from incinerator
WWTP Damhusåen = biogas motor + boiler

CONSUMPTION

	UNIT	WWTP LYNETTEN	WWTP AVEDØRE	WWTP DAMHUSÅEN	TOTAL	DATA IS DETERMINED BY
Precipitation chemicals	t/year	1,108	869	1,001	2,978	M
Lye/NaOH (50 %)	t/year	466	517	-	983	M
Ammonia solution (24 %)	t/year	5	-	-	5.3	M
Polymers	t/year	168	45	69	282	M
Activated carbon	t/year	9	6	-	15	M
Drinking water	m^3/year	50,975	23,849	1,781	76,605	M

WASTE AND RESIDUE

REUSE	UNIT	WWTP LYNETTEN	WWTP AVEDØRE	WWTP DAMHUSÅEN	TOTAL	DATA IS DETERMINED BY
Ash	t DM/year	1,659	-	-	1,659	M
Sand	t/year	319	-	235	554	M
INCINERATION						
Small combustibles	t/year	27	-	7	34	M
Screenings	t/year	677	764	233	1,674	M
LANDFILL						
Internal landfill site						
Ash	t DM/year	2,040	2,849	-	4,889	M
Sand	t/year	-	338	-	338	M
External landfill site						
Flue gas waste	t DM/year	455	37	-	492	M

M = Measurement
C = Calculation
- = Parameter not relevant

EXAMPLES OF MEASUREMENTS: Online flow measurements, reading of meters, inventory and weighing

EXAMPLES OF CALCULATIONS: Flow-proportional day sampling, mix tests of random samples, calculated on the basis of operational hours, weighing and dry matter determination, AMS-continuous measurements.