

Feasibility report Östra Göinge

Municipality of Östra Göinge

2014

EUROSLAM TECHNOLOGY AND COST ANALYSIS QUESTIONNAIRE: WWTP WITH EX**GENERAL INFORMATION**

WWTP Name: Knislinge Waste Water treatment plant	
Type: Municipal WWTP	
Name of Municipality/Organisation: Ostra Goinge municipality	
Plant location: Knislinge, Ostra Goinge kommun, Skåne Län	
Contact Name, Phone Number: Bjarne Segertseen, +46 44 7756182	
E-mail: bjarne.segertseen@ostragoinge.se	
WWW: ostragoinge.se	
Google Maps:	
Photos:	
Average flow rate by design	2 640
Maximum flow rate by design	5 400
PE dimension by design	6 000

WASTEWATER TREATMENT

-----> 2012 average day

-----> WWTP P

Raw sewage	
Real flow rate average	1 100
Real flow rate maximum	2 800
Real PE dimension	
COD	530
BOD7	220
N	50
P	6
Primary treatment	
HRT	n.a.
Primary Sludge (PS)	
Flow rate	n.a.
TS	
VS (% TS)	
Activated sludge tank	
Flow rate	1 100
Volume	510
BOD7 at the inlet	220
COD5 at the inlet	530
Type of aeration	Diffuse
Oxygen concentration	2
MLSS	5 000
MLVSS	
Sludge load	0
Sludge age	20
Nitrogen removal	
Type	Upstream bio
External carbon sources used	No
Quantity of external carbon source necessary for denitrifying	
Type of carbon source used for denitrifying	
Nitrates to remove	
Volume of the anoxic zone in the biological reactor	
Phosphorus removal	
Biological removal (Bio-P)	Yes
Chemical P-precipitation	Yes
Simultaneous	Yes
Secondary clarification	
HRT	1
SVI	300
Bulking	Yes
Foaming	Yes
Return Activated Sludge (RAS)	
Flow rate	

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TS	1 000
Load	
VS (% TS)	80
Waste Activated Sludge (WAS)	
Flow rate	
TS	2 000
Load	
VS (% TS)	80
Effluent characteristics	
COD	45
BOD7	3
N residual	25
P residual	0
TSS	

SLUDGE THICKENING [-----> MORE TECH](#)

Thickened Primary Sludge (TPS)	
Equipment	
Flow rate	
TS	
TS load	
VS (% TS)	
VS load	
Flocculant	
Flocculant quantity	
Thickened Waste Activated Sludge (TWAS)	
Equipement	
Flow rate	200
TS	1
TS load	2
VS (% TS)	80
VS load	
Flocculant	n
Flocculant quantity	

MIXED DIGESTER FEED [-----> BEFORE PRE-TREATMENT](#) [-----> MORE TECH](#)

Flow rate	
Wet Feedstock Consumption	
Wet Feedstock Consumption	
Sludge	
Sludge load	
Another Fuel ----- > see: Expenses. Fuel Cost.	
Another Fuel load	
Total Solids Fraction of Wet Feedstock (kg/kg)	
TS load	
Ratio of Volatile Solids to Total Solids in Feedstock (kg/kg)	
VS load	
Inorganic solids load	
% of TPS in mixed digester feed	
% of TWAS in mixed digester feed	

FEESTOCK PRE-TREATMENT [-----> MORE TECH](#)

Technology:	
Technology:	
Technology:	
Manufacturer	
..... added	
Manufacturer	
Dosage	
.....cost	

EUROSLAM TECHNOLOGY AND COST ANALYSIS QUESTIONNAIRE: WWTP WITH EX

Total electrical energy associated with feedstock pre-treatment	
Total electrical energy cost associated with feedstock pre-treatment	
Total heat associated with feedstock pre-treatment	
Total heat cost associated with feedstock pre-treatment	

ANAEROBIC DIGESTION[-----> MORE TECH](#)**Anaerobic digestion**

Anaerobic Digestion System:	
Types of Anaerobic Reactors:	
Manufacturer	
N° of digesters tanks	
Volume per digester tank	
Total volume of digestion	
Temperature in digester N° 1	
Temperature in digester N° 2	
Operational pressure	
Capacity, throughput	
HRT	
Gas storage capacity	

Digester feed

Total Solids Fraction of Wet Feedstock (kg/kg)	
TS load	
Ratio of Volatile Solids to Total Solids in Feedstock (kg/kg)	
VS load	
Wet Feedstock Consumption	
Wet Feedstock Consumption	
..... added	
Manufacturer	
Dosage	
.....cost	

Performances

Biodegradability (kg VS destroyed/kg VS added)	
VS reduction in loading (Δ)	
TS reduction	
TS reduction in loading (Δ)	

Biogas & Methane

Biogas production	
Biogas production	
Biogas production (Nm ³ /kg VS destroyed)	
Biogas produced per VS fed	
Methane Concentration in Biogas	
Biogas for cogeneration	
Biogas flared	
Biogas for other uses	

BIOGAS UPGRADING[-----> MORE TECH](#)

Technology description:	
Manufacturer	
Biomethane capacity	
Biomethane quality --- vol.-% CH ₄	
Losses	
Utilisation	
Total electrical energy associated with biogas upgrading	
Total electrical energy cost associated with biogas upgrading	

ELECTRICAL ENERGY[-----> MORE TECH](#)

Plant electricity consumption per year (KWh)	550 000
Total electrical energy cost	
Total electrical energy associated with aeration	400 000
Total electrical energy cost associated with aeration	

EUROSLAM TECHNOLOGY AND COST ANALYSIS QUESTIONNAIRE: WWTP WITH EX

Total electrical energy associated with AD	
Total electrical energy cost associated with AD	
Power generation facilities	
Power in Biogas (kW)	
Gross Electrical Capacity (kWe)	
Net Electrical Capacity (kWe)	
Availability of CHP	
CHP operational hours per year	
Net Efficiency -- Biogas to Electricity (%)	
Gross Efficiency -- Biogas to Electricity (%)	
Purchased power cost	
Aggregate sales price for power	

HEAT -----> MORE TECH	
Total heat associated with AD	
Total heat cost associated with AD	
Total heat production rate (kWth)	
Aggregate fraction of heat recovered (%)	
Recovered heat (kWth)	
Installed heating power	
Plant heat consumption per year	
Purchased heat cost	
Aggregate sales price for heat	

SLUDGE DEWATERING -----> MORE TECH	
Equipment	
Manufacturer	
Polymer added	yes
Dosage	5
Polymer cost	30
Cake dryness	22
Total electrical energy associated with dewatering	
Total heat associated with dewatering	

SLUDGE FOR DISPOSAL -----> MORE TECH	
Final use	
Biosolids disposal cost	360
Biosolids load for disposal (dry matter)	140
Biosolids load for disposal (wet matter)	630

STING AD

g/l
ton/d
%

m³/d
g/l
ton/d
%

mg/l
mg/l
mg/l
mg/l
mg/l

NICAL DATA, PHOTOS

m³/d
%
ton/d
%
ton/d
Y/N
kg/ton TS

m³/d
%
ton/d
%
ton/d
Y/N
kg/ton TS

NICAL DATA, PHOTOS

m³/d
ton/d
ton/year
%
ton/year
%
ton/year
%
ton/year
%
ton/year
ton/year
%
%

NICAL DATA, PHOTOS

Y/N
kg/dry matter ton
LCU/kg

STING AD

KWh/year
LCU/year
KWh/year
LCU/year

NICAL DATA, PHOTOS

Each
m ³
m ³
° C
° C
mbar
m ³ /d
d
m ³

%
ton/year
%
ton/year
ton/year
m ³ /d
Y/N

kg/dry matter ton
LCU/kg

%
ton/year
%
ton/year

Nm ³ /d
Nm ³ /year
Nm ³ /kg VS destroyed
Nm ³ /kg VS fed
% by volume
Nm ³ /year
Nm ³ /year
Nm ³ /year

NICAL DATA, PHOTOS

--

Nm ³ /h
% by volume
% by volume

KWh/year
LCU/year

NICAL DATA, PHOTOS

KWh
LCU/year
KWh/year
LCU/year

STING AD

KWh/year
LCU/year
Y/N
kW
kWe
kWe
%
hours
%
%
LCU/KWh
LCU/KWh

NICAL DATA, PHOTOS

KWh/year
LCU/year
kWth
%
kWth
kWth
KWh
LCU/KWh
LCU/KWh

NICAL DATA, PHOTOS

Belt press
Y/N
kg/dry matter ton
SEK/kg
%
KWh/year
KWh/year

NICAL DATA, PHOTOS

Agriculture
LCU/wet matter ton
Dry matter ton/year
Wet matter ton/year