Part-financed by the European Union
(European Regional Development Fund)

Feasability report Kos Keo

Municipal Infrastructure Company "KOS-KEO"

2014

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EUROSLAM TECHNOLOGY AND COST ANALYSIS QUESTIONNAIRE: WWTP WITH EXI

GENERAL INFORMATION	
WWTP Name: Waste water treatment plant in Koscierzyna	
Type: Mechanical- biological with nutrients removal	
Name of Municipality/Organisation: Municipal Infrastructure Company "KOS-KEO"	
Plant location: Koscierzyna , Markubowo 7	
Contact Name, Phone Number: Aneta Frankowska	
E-mail:	
WWW:	
Google Maps:	
Photos:	
Average flow rate by design	3 600,00
Maximum flow rate by design	41 717,00
PE dimension by design	

WASTEWATER TREATMENT ----------> 2011 average day	------> WWTP Proces
Raw sewage	
Real flow rate average	3 250,00
Real flow rate maximum	5 500,00
Real PE dimension	26 500,00
COD	1 100,00
BOD	490,00
N	88,00
P	13,00
Primary treatment: non exist	
HRT	
Primary Sludge (PS)	
Flow rate	
TS	
VS (% TS)	
Activated sludge tank	
Flow rate	
Volume	2*6000
BOD5 at the inlet	non analyse
COD5 at the inlet	non analyse
Type of aereation	diffused aer
Oxygen concentration	0,5 mg - 2,0
MLSS	
MLVSS	non analyse
Sludge load	
Sludge age	16-24d
Nitrogen removal	
Type	nitryfication and de
External carbon sources used	N
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	ason from 1700m3 up 3400 m3

Phosphorus removal	
Biological removal (Bio-P)	Y
Chemical P-precipitation	N
Simultaneous	N
Secondary clarification	
HRT	3-6 hours
SVI	120-180
Bulking	N
Foaming	N
Return Activated Sludge (RAS)	
Flow rate	4000-4500

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EUROSLAM TECHNOLOGY AND COST ANALYSIS QUESTIONNAIRE: WWTP WITH EXI

TS	4,0-5,0
Load	
VS (% TS)	non analyse
Waste Activated Sludge (WAS)	
Flow rate	300,00
TS	
Load	
VS (% TS)	
Effluent characteristics	
COD	43,00
BOD5	7,10
N residual	7,60
P residual	0,46
TSS	9,50

SLUDGE THICKENING	-------> MORE: TECHNICA
Thickened Primary Sludge (TPS) - non exist	
Equipment	
Flow rate	
TS	
TS load	
VS (% TS)	
VS load	
Flocculant	
Flocculant quantity	
Thickened Waste Activated Sludge (TWAS)	
Equipement	Gravity thick
Flow rate	100,00
TS	2-3 %
TS load	1,5-1,8 Mg /d
VS (% TS)	non analyse
VS load	
Flocculant	N
Flocculant quantity	

MIXED DIGESTER FEED ----> BEFORE PRE-TREATMENT	-------> MORE: TECHNICA
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: TECHNICA
Technology:	
Technology:	
Technology:	
Manufacturer	
…….. added	
Manufacturer	
Dosage	
……..cost	

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EUROSLAM TECHNOLOGY AND COST ANALYSIS QUESTIONNAIRE: WWTP WITH EXI

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: TECHNICA
Anaerobic digestion	
Anaerobic Digestion System:	
Types of Anaerobic Reactors:	
Manufacturer	
Nº of digesters tanks	
Volume per digester tank	
Total volume of digestion	
Temperature in digester Nº 1	
Temperature in digester Nº 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 (∆)	
TS reduction	
TS reduction in loading (∆)	
Biogas & Methane	
Biogas production	
Biogas production	
Biogas production (Nm3/kg VS destroyed)	
Biogas produced per VS fed	
Methane Concentration in Biogas	
Biogas for cogeneration	
Biogas flared	
Biogas for other uses	

BIOGAS UPGRADING	-------> MORE: TECHNICA
Technology description:	
Manufacturer	
Biomethane capacity	
Biomethane quality --- vol.-% CH4	
Losses	
Utilisation	
Total electrical energy associated with biogas upgrading	
Total electrical energy cost associated with biogas upgrading	

ELECTRICAL ENERGY	-------> MORE: TECHNICA
Plant electricity consumption per year (KWh)	
Total electrical energy cost	
Total electrical energy associated with aeration	
Total electrical energy cost associated with aeration	

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EUROSLAM TECHNOLOGY AND COST ANALYSIS QUESTIONNAIRE: WWTP WITH EXI

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: TECHNICA
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: TECHNICA
Equipment	
Manufacturer	
Polymer added	Y
Dosage	
Polymer cost	
Cake dryness	18-19%
Total electrical energy associated with dewatering	
Total heat associated with dewatering	

SLUDGE FOR DISPOSAL	-------> MORE: TECHNICA
Final use	
Biosolids disposal cost	
Biosolids load for disposal (dry matter)	45Mg d.m./ha/3years -according the sludge's law
Biosolids load for disposal (wet matter)	

STING AD

m³/d
m³/d
PE

s Flow Diagram
m³/d
m³/d
PE
mg/l
mg/l
mg/l
mg/l
h
m³/d
g/l
%
m³/d
m³
mg/l
mg/l
ation
mg/l
mg/l
mg/l
kg BOD5/kg TS·day
d
nitryfication
Y/N
kg/d
mg/l
m3

Y/N
Y/N
Y/N
d
ml/g
Y/N
Y/N
m³/d

STING AD
g/l
ton/d
%
m³/d
g/l
ton/d
%
mg/l
mg/l
mg/l
mg/l
mg/l

L DATA, PHOTOS
m³/d
%
ton/d
%
ton/d
Y/N
kg/ton TS
ener
m³/d
%
ton/d
%
ton/d
Y/N
kg/ton TS

L DATA, PHOTOS
m³/d
ton/d
ton/year
%
ton/year
%
ton/year
%
ton/year
%
ton/year
ton/year
%
%

L DATA, PHOTOS
Y/N
kg/dry matter ton
LCU/kg

STING AD
KWh/year
LCU/year
KWh/year
LCU/year

L DATA, PHOTOS
Each
m³
m³
° C
° C
mbar
m³/d
d
m³
%
ton/year
%
ton/year
ton/year
m³/d
Y/N
kg/dry matter ton
LCU/kg
%
ton/year
%
ton/year
Nm³/d
Nm³/year
Nm³/kg VS destroyed
Nm³/kg VS fed
% by volume
Nm³/year
Nm³/year
Nm³/year

L DATA, PHOTOS
Nm³/h
% by volume
% by volume
KWh/year
LCU/year

L DATA, PHOTOS
KWh
LCU/year
KWh/year
LCU/year

TAB]

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

L DATA, PHOTOS
KWh/year
LCU/year
kWth
%
kWth
kWth
KWh
LCU/KWh
LCU/KWh

L DATA, PHOTOS
belt press
Y/N
kg/dry matter ton
LCU/kg
%
KWh/year
KWh/year

L DATA, PHOTOS
landfill
LCU/wet matter ton
Dry matter ton/year
Wet matter ton/year