

Small Sewage Treatment Plants: Comparison of Costs

	Source of costs	Activated sludge system and SBR	Upgrade of existing septic tank	Fixed bed	Biofilm with filtration	Constructed wetland	Clearfox nature	Minimum saving	Maximum saving
1 Investment costs									
1.1	Complete treatment plant	3.650,00 €	1.200,00 €	3.850,00 €	3.800,00 €	2.500,00 €	3.950,00 €		
1.2	Transport	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €		
1.3	Earthworks	1.500,00 €	650,00 €	1.500,00 €	1.500,00 €	3.500,00 €	1.500,00 €		
1.4	Installation	0,00 €	450,00 €	0,00 €	0,00 €	0,00 €	0,00 €		
1.5	Approval	300,00 €	300,00 €	300,00 €	300,00 €	300,00 €	300,00 €		
1.6	Start-up	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €		
	Sum	5.450,00 €	2.600,00 €	5.650,00 €	5.600,00 €	6.300,00 €	5.750,00 €	-3.150,00 €	550,00 €
2 Yearly running costs									
2.1	Energy costs	55,00 €	55,00 €	50,00 €	0,00 €	0,00 €	0,00 €		
2.2	Repair costs	150,00 €	150,00 €	100,00 €	175,00 €	50,00 €	50,00 €		
2.3	Sludge Removal	140,00 €	140,00 €	140,00 €	80,00 €	80,00 €	80,00 €		
2.4	Maintenance costs	160,00 €	160,00 €	160,00 €	80,00 €	80,00 €	80,00 €		
	Sum	505,00 €	505,00 €	450,00 €	335,00 €	210,00 €	210,00 €	0,00 €	295,00 €
3 Running Costs summarized over 10 Years									
		5.693,73 €	5.693,73 €	5.074,59 €	3.741,52 €	2.345,43 €	2.345,43 €	0,00 €	3.348,30 €
4 Saving of running costs with clearfox nature in comparison with different systems (savings invested with 3% interest per year)									
		3.931,79 €	3.931,79 €	3.204,48 €	1.640,54 €	0,00 €	0,00 €	0,00 €	3.931,79 €

Comments:

- The numbers include betterment tax
- 1.1 Pretreatment + biological treatment + final treatment dependent on the system (4PE); An upgrade only needs the kit to be installed.
The numbers are average costs in Germany. They are differing a lot according to the price levels in other regions and countries.
In some cases costs for application forms (up to 500€) and assessment (up to 400€) have to be added.
- 1.2 In most of the cases costs for transportation are included. Distances above 100km have often to be paid extra.
- 1.3 In the case of upgrading the water tightness must be ensured before.
- 1.4 Additional costs for crane according to the treatment system; in the case of upgrading installation costs for the kits have to be paid
- 1.5 The assessment has to be done by a surveyor and is needed for all systems.
- 1.6 The start-up is usually included. Clearfox nature is a plug and play system.
- 2.1 Energy costs for magnetic valves, compressors, pumps, control, faults and telemetric depend on the system and range between 40-150€
Calculation: consumption of energy in kWh/a x energy costs in €/kWh, assumption: 0,15€/kWh
- 2.2 Costs for repair include costs for deterioration of pumps 150€/5a, compressors 375€/10a, seals 40€/2a, magnetic valves 50€/7a, control 675€/12a) and costs for exchange
Treatment plants with biofilm and filtration: cleaning the filtermaterial 150€/2a, exchange and removal 500€/5a
Costs for the replacement equipment are based on current prices and can vary a lot according to the country and the dealer.
- 2.3 Primary and secondary sludge according to the amount: 40,00€/m³ + Anfahrt 20,00€
Average assumption for SBR, activated sludge system and fixed bed: 3m³/a,
Biofilmplants with filtration, constructed wetlands and Clearfox nature 1,5m³/a (no secondary sludge)
- 2.4 The intervals of maintenance depend on the German National Approval, usually 2x/a for technical plants and 1x/a for natural systems.
Assumption: 80,00€/maintenance plus replacement equipment plus fault-clearing service
- 3 Annual costs summarized over 10 years including rising prices 2%/a and rising energy costs 3,5%/a
The amelioration is assumptive and can vary market-driven

Sources: Auth und Seyler, Bavarian Environment Agency; Straub, University of Lausitz, Cottbus; manufacturer's data

In perpetuity Clearfox nature is the most affordable system between all preinstalled sewage treatment systems appeared on the market.

The buyer gets after 10 years

up to 3300 €uro savings!!

Including the 3% interest of the saved money the saving even rises

up to 3900 €uro!

Above all the recycling costs for the plastic containers are essentially lower than those for concrete containers. Clearfox nature can totally be reused!