

# BIOGILL TECHNOLOGY COMPARISON

TECHNOLOGY	CAPEX (\$/kL of installed capacity)*	OPEX (Electricity) (\$/kL/d)*	KEY FEATURES							
			ENERGY	WATER	CHEMICALS	PARTS	MAINTENANCE	LABOUR	FOOT PRINT	TOLERANCE
Conventional Activated Sludge / Sequencing Batch Reactor	800 - 1000	0.50 – 0.60	Moderate energy levels to provide dissolved oxygen levels sufficient for aerobic conditions.	Nil	May be required to control surface foaming.	High number of moving parts and consumables (liquids / oils etc)	Periodic maintenance of air blowers / surface aerators, foam control systems, etc.	Semi skilled labour required to monitor reactor behaviour and adjust on daily basis	Large plant foot print required due to lower (relative) biomass concentrations.	Small tolerance to varying feed water concentrations. Sludge settling can deteriorate leading to lower treated water quality.
Moving Bed Biofilm Reactor	750 - 900	0.60 – 0.70	Energy intensive aeration required for high oxygen levels and suspend media.	Nil	Nil	High number of moving parts and consumables (liquids / oils etc) Replenish lost or damaged media.	Periodic maintenance of air blowers, foam control systems, repair media grates etc.	Skilled labour required to inspect carrier biofilm and monitor reactor / troubleshoot	Smaller plant foot print due to high biomass concentrations.	High tolerance to varying feed water concentrations due to attached growth biomass stability and high biomass concentration.
Membrane Bio Reactor	800 - 1400	0.60 – 1.10	Energy intensive air scour blowers required.	Required for reverse flush of membranes and chemical cleaning.	Regular cleaning of membranes required to control fouling.	High number of moving parts and consumables (liquids / oils etc). Reported membrane life of 10 yrs.	Periodic maintenance on air scour blowers, chemical supply systems and permeate pumps. Calibration of differential pressure sensors	Skilled labour required to digest operating parameters (TMP/ Flux etc) and adjust / troubleshoot	Smaller plant foot print due to high biomass concentrations.	High tolerance to varying feed water concentrations due to high biomass concentration and combined filtration step negating sludge settling issues.
BioGill	600 - 900	0.15 – 0.30	Nil. Freely abundant in atmosphere	Nil	Nil	No moving parts, no consumables. Reported membrane life of > 10 yrs.	Inspect and hose down of dispersion tray periodically. Inspect recirculation pump operation periodically.	Unskilled labour required. Limited operator involvement.	Moderate plant foot print required due gill packing density and retention tank. In many cases similar to SBR.	High tolerance to varying feed water concentrations due to biomass concentrations and attached growth on gills.

\*Costs are estimated based on unit process contribution ONLY for STP and F&B processes within the range of 0 – 500kL/d. Electricity is calculated based on \$0.15/kWh. Sample of 12 total STP and F&B projects.

For further information please contact:

**AMERICAS** infoamericas@biogill.com

**APAC** infoapac@biogill.com

**CHINA** infochina@biogill.com

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