

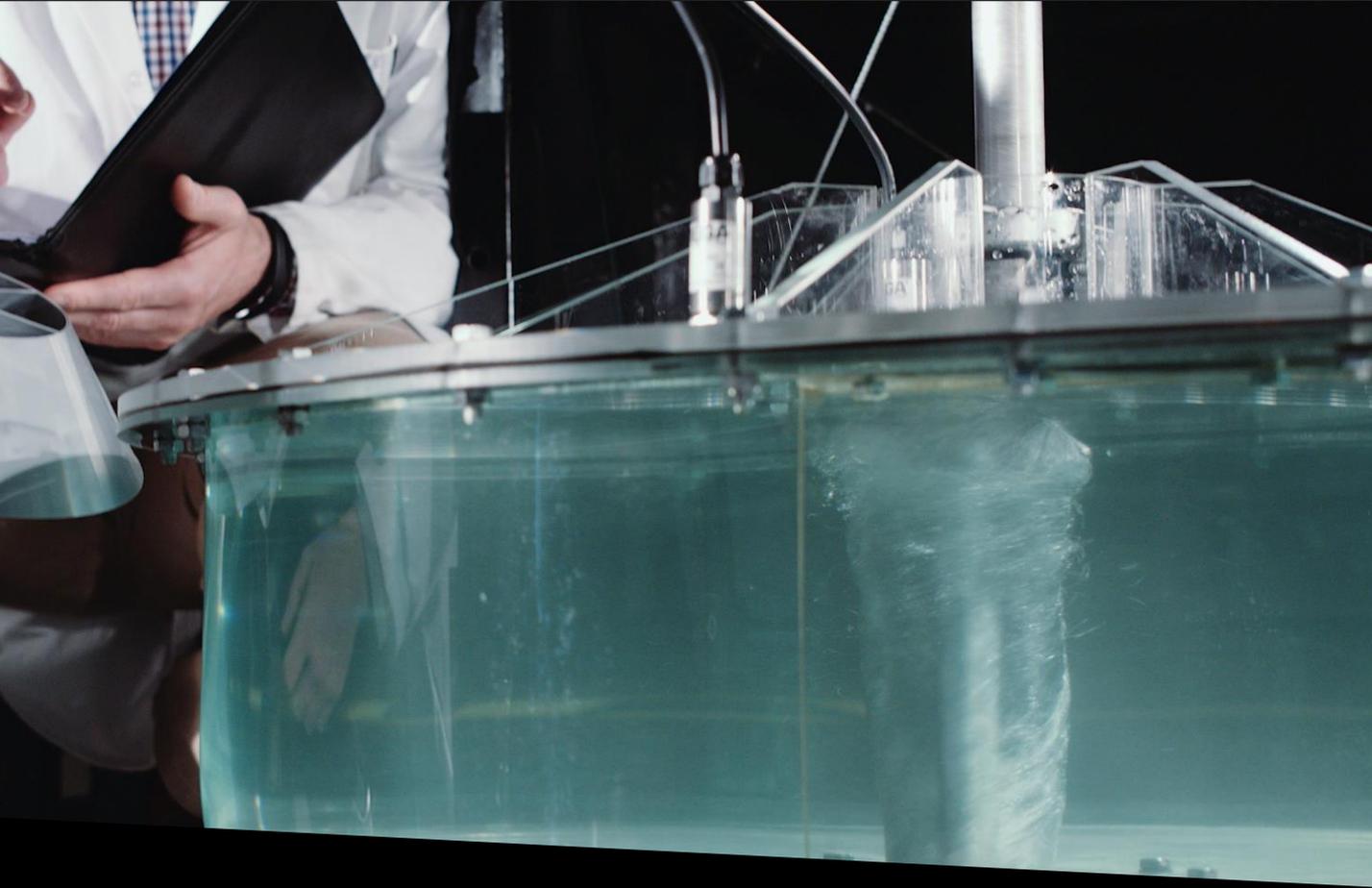


VorTech Water Solutions

# Vortex Power Aerator (VPA)

An investment in energy-efficient aeration





## Introduction

# Reduce your aeration energy costs by up to 50%

**The energy (and CO<sub>2</sub>) footprint** of wastewater treatment is significant, accounting for nearly 2% of the world's electricity use and costing about \$40bn per year globally in energy spend. Population growth, increasing stringency of environmental regulation and rising energy costs are factors now compelling wastewater treatment plants to become more energy efficient.

The main contributor to the energy intensity of wastewater treatment is the aeration process, which accounts for up to 75% of the energy consumption of a typical wastewater treatment plant.

**The Vortex Power Aerator (VPA)**, uses a novel cyclonic method of mixing air and water to massively reduce the energy intensity in aeration and mixing processes of wastewater treatment.

Instead of relying on costly, high maintenance blowers to pump air, under 4 to 5 m of water pressure at the bottom of the tank, the VPA instead lifts water to the surface of the tank where it is mixed with air in a cyclone requiring low pressure and power. This is how the VPA can maintain high oxygen transfer rates and aeration efficiencies.

**Standard aeration efficiency (SAE)** is the ratio of oxygen supplied to the energy consumed. The SAE of VPA is 2.5 kgO<sub>2</sub>/kW.hr and performance does not deteriorate in process conditions

# Vortex Power Aeration (VPA): A new twist in energy efficient upgrades



The VPA is an efficient, mechanical aeration system providing oxygen transfer and mixing simultaneously suitable for both municipal and industrial wastewater treatment facilities

✓ **High Efficiency**

Patented cyclone technology can aerate wastewater at 2.5 kgO<sub>2</sub>/kW.hr with high alpha factors in process conditions

✓ **Eminently Retrofittable**

Can be installed in existing facilities in mere hours with no downtime saving months of installation work

✓ **Low Capex**

Due to a small number of parts and short fitting time, a VPA installation has a substantially lowered capex compared to FBDA

✓ **No Noise or Splashing**

The patented chamber is fluid mechanically designed to eliminate noise, splashing and aerosols

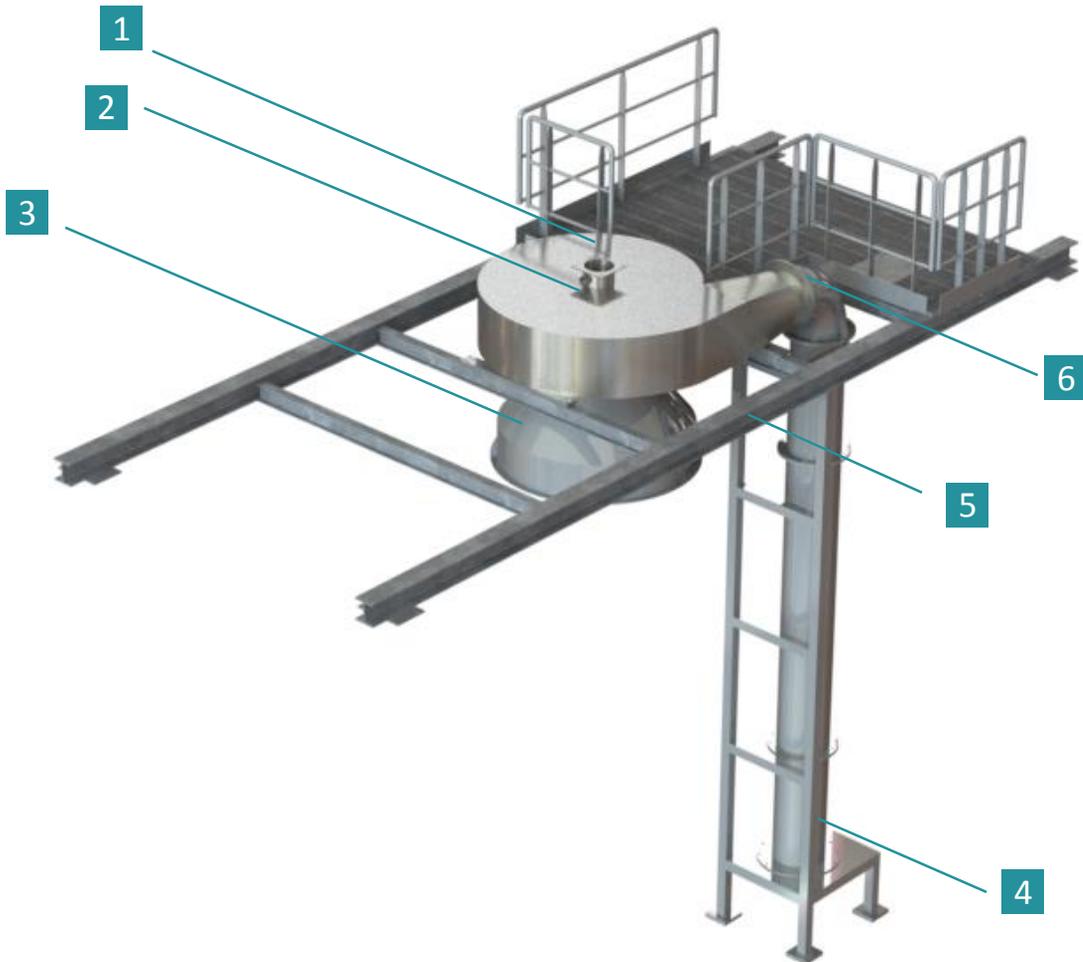
✓ **Low Maintenance**

With minimal moving parts, clogging is minimised. The pumping system has a proven 20 year lifespan

✓ **No Additional Equipment**

The system operates as an aerator and anoxic mixer and therefore is not reliant on additional mixing equipment

# Providing an effective solution for a big problem



Following three years of development, working closely with treatment plant operators, our technology achieves superior performance at a significantly reduced cost

### 1 Cyclone Chamber

Patented stainless steel cyclone chamber ensures thorough mixing of the tank's contents and uniform dispersion of dissolved oxygen

### 2 Smart Oxygen Regulation

Oxygen can be regulated for energy efficiency or terminated for anoxic treatment applications

### 3 Flow Booster Technology

Patented, anti-rag, annular jet technology induces additional flow and mixing in the tank

### 4 Pump Chamber

The VPA's pull and push effect together with flow booster technology, induces high mixing and aeration rates

### 5 Custom Made Support Structure

Installed at the top of the wastewater tank for safer and easier retrofits with above water equipment access

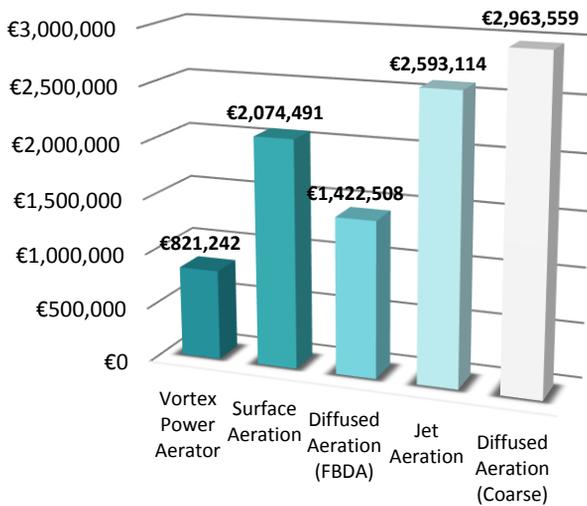
### 6 Easy Access and Maintenance

Safe and easy access for pump maintenance and inspection

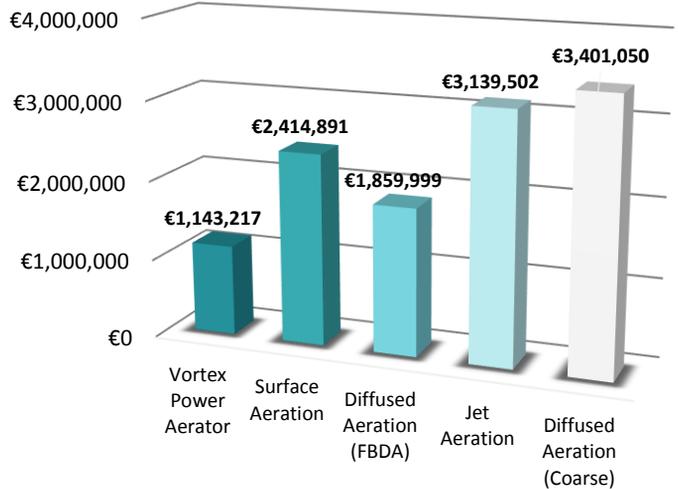
# Lowest Cost of Ownership



Plant A - 20 Year Energy Costs



Plant A - 20 Year Totex



### Low Opex

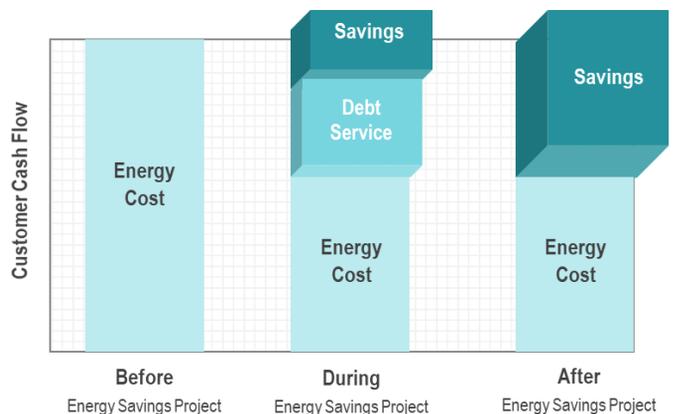
Due to high aeration efficiency and sustained high performance in process conditions, VPA can acquire up to 50% energy savings

### Lowest Cost of Ownership

Low opex combined with low capex, through minimal components and ease of installation, yields the lowest cost of ownership technology choice

### Performance Contracting: ESCO

Performance contracts make it possible to undertake energy efficient upgrades without the need for client capital outlay. An energy service company (ESCO) can complete a package of upgrades and improvements that reduce energy and operating costs by a defined amount over a contract term. The improvements are offset from the savings that result. For more information on this financing model, contact [info@vortechws.com](mailto:info@vortechws.com).



# Leveraging in-house expertise to find new ways to optimise treatment plants



## Product Innovation

Through innovation and R&D, we continue to tackle new challenges and develop novel technology solutions to be shaped into products for our customers



## Design & Consultancy

We provide high-value, specialised engineering and consultancy services for new builds, upgrades or optimisation programs



## Installation & Maintenance

VorTech can facilitate commissioning and maintenance services through qualified partners located around the globe



## Audits and Technical Reports

We provide bespoke auditing and scientific/technical reports on existing infrastructure to determine optimisation and efficiency measures for our clients



## Online Monitoring

Online monitoring of equipment and processes provides fail-safe, efficient and cost effective management of a plant's performance



## Feasibility and Finance

Struggling to source capital for an energy efficient upgrade? Contact us to learn more about novel capital finance programs

Find out how your plant is doing today; contact us at [info@vortechws.com](mailto:info@vortechws.com)



The Company

# VorTech Water Solutions

We address the worlds leading water and wastewater challenges by developing and delivering innovative, cost effective solutions that make a real difference towards improving the sustainability of the industry.

VorTech Water Solutions Ltd was founded in 2019. It's core products which focus on aeration, mixing and hydropower (designed using the principles of fluid dynamics) have garnered international interest with a number of municipal, industrial and aquaculture players. The company has over 50 years of combined deep technology expertise in areas such as vortex fluid dynamics, hydraulics, energy efficiency, wastewater process and control, biochemistry, sustainable product design, commercial scaling and energy finance.

For more information on VorTech's products and services, contact the team on [info@vortechws.com](mailto:info@vortechws.com)



For more information or to request a quote, contact [sales@vortechws.com](mailto:sales@vortechws.com)  
[www.vortechws.com](http://www.vortechws.com)