



AquaEnergy Expo
Magazine
Towards a Green Blue Smart
Sustainable World

November 2022 Issue 23



NexTurbo
TECHNOLOGIES

NEXT TURBO BLOWERS: SMART PERFORMANCE FOR MODERN WASTEWATER PLANTS



FILTRALITE®

**Biological Filtration: A Sustainable
Solution for Drinking Water Treatment
Challenges**

ORASCOM
CONSTRUCTION

**Orascom Construction PLC:
Our Impact Transcends Borders**

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AL MOUSA
AL MOUSA TRADING CO. شركة الموسى للتجارة

**Engineering Excellence: Inside Al Mousa
Trading Co.'s Global Partnerships and
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**Arab Water & Energy
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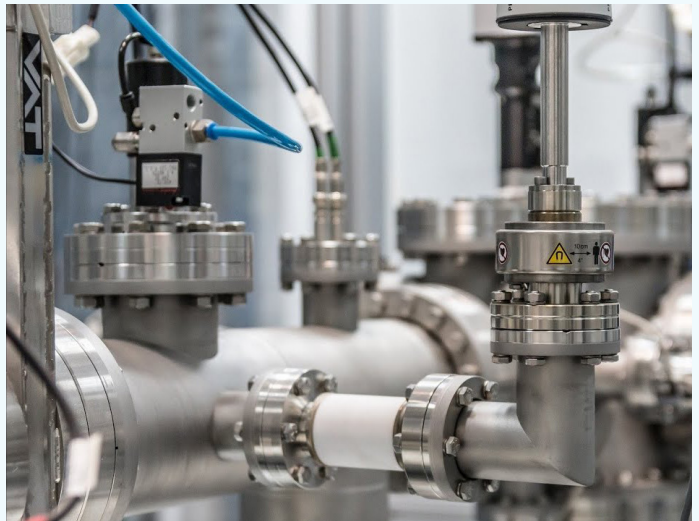


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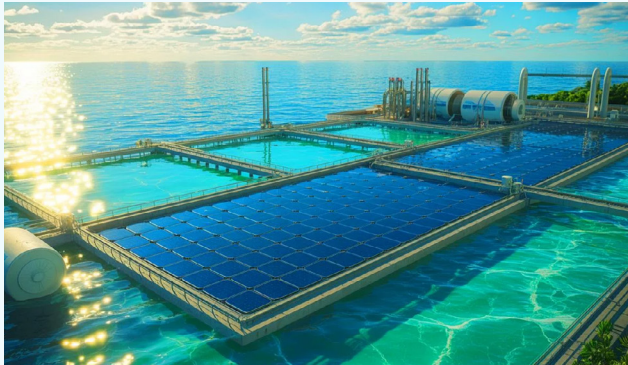
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Innovative Solutions to Achieve Sustainability in Water and Energy

From The Editor

As global challenges surrounding water, energy, and sustainability intensify, innovation continues to define our collective progress. This issue celebrates the pioneering technologies and visionary organizations driving transformation across the water and energy sectors in the Middle East and beyond.

We open with **Next Turbo Technology**, a global leader in high-efficiency turbocompressors that are reshaping wastewater aeration. Designed for reliability, simplicity, and energy optimization, Next Turbo's blowers deliver outstanding performance while minimizing operational costs and environmental impact. With over 200 installations in more than 30 countries, the company stands as a benchmark for sustainable engineering excellence in wastewater management.

From energy optimization, we move to **Filtralite®**, a brand redefining drinking water treatment through biological filtration. The success of Filtralite® Pure at the Putatan II Water Treatment Plant in the Philippines demonstrates how naturally occurring microorganisms, supported by advanced filtration media, can remove ammonia, organic matter, and turbidity – producing clean, safe water while reducing chemical usage. It's an inspiring example of how technology and biology can work in harmony for a sustainable future.

Our journey continues with **Al Mousa Trading Co.**, one of Saudi Arabia's leading names in water, HVAC, and energy systems. By partnering with global innovators like Grundfos, Wilo, and Viessmann, Al Mousa integrates international standards with local expertise to deliver efficient, high-performance engineering solutions.

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Its role in major national infrastructure projects reflects Saudi Arabia's vision of sustainability and progress.

Equally impactful is **Orascom Construction PLC**, a powerhouse of engineering excellence with a global footprint. From world-class infrastructure and renewable energy projects to advanced water treatment facilities, Orascom's leadership embodies a commitment to innovation, quality, and community development. Its legacy continues to expand through strategic investments and partnerships that strengthen its global reach.

This issue also explores **REC Solar's** cost-effective Power Purchase Agreements, thermodynamic desalination powered by solar energy, and **Fortinet's** insights on cybersecurity – essential in protecting our increasingly digital utilities.

Finally, the **BEWISE** Facility in the UK showcases research collaboration at scale, advancing net-zero wastewater treatment.

Innovation, partnership, and purpose remain the cornerstones of progress – guiding us toward a smarter, cleaner, and more resilient world.



Mohamed Khalifa
Founder and CEO



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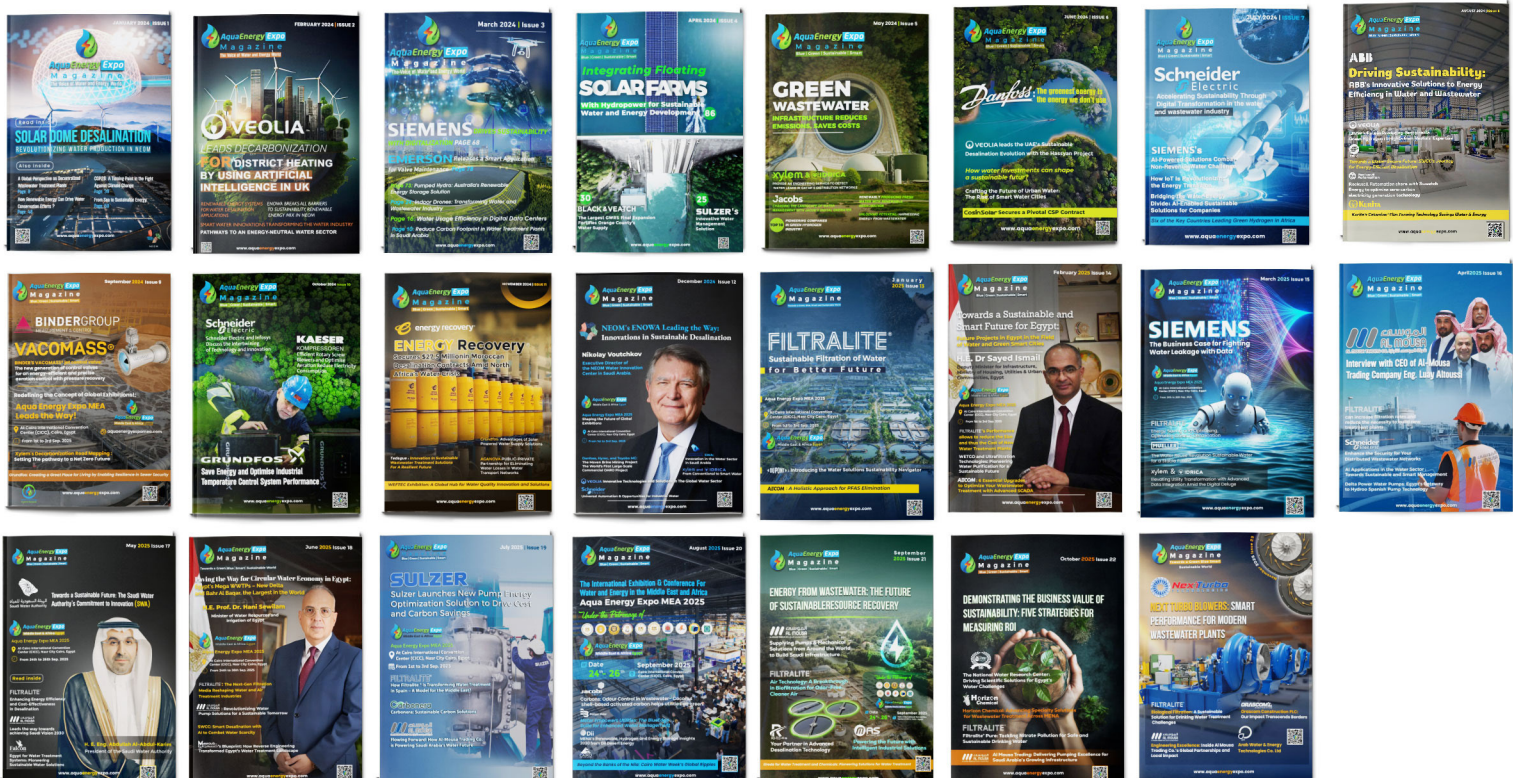
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Aqua Energy Expo magazine
includes more than 1000 unique
articles and news about global
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NexTurbo
TECHNOLOGIES

Next Turbo Blowers: Smart and Efficient Performance for Advanced Wastewater Treatment

Founded in 2014, Next Turbo Technology has rapidly positioned itself among the leading global players in turbocompressor innovation. Built upon decades of engineering expertise, the company develops and manufactures integrally geared, single-stage centrifugal blowers designed to deliver maximum energy efficiency, reliability, and ease of operation. Next Turbo's product range covers motor drive powers from 37 to over 4,500 kW, serving diverse applications across wastewater treatment, power generation, and the oil & gas sectors. Through its global partner network, the company provides not only advanced machinery but also comprehensive automation and monitoring solutions. Every unit undergoes a full-load performance test before leaving the factory, ensuring the highest standards of quality and certification compliance.

“In the harsh climate of the M. East & Gulf region, you require a high-quality, robust machine that can operate in any condition and throughout its 25+ years of lifetime- as proven in many installations, Adam said.”



A Proven Legacy of Reliability

Next Turbo blowers have been successfully installed in over 200 projects across more than 30 countries. A blower technology that has a 25+ years proven lifetime.

This impressive track record highlights the company's commitment to longevity and operational excellence, offering wastewater treatment plants sustainable, low-maintenance aeration systems that stand the test of time. Manufactured entirely in Italy, Next Turbo blowers are built with high-precision components and non-proprietary spare parts, ensuring long-term serviceability and availability worldwide. The company's philosophy revolves around efficiency through simplicity — designing systems that

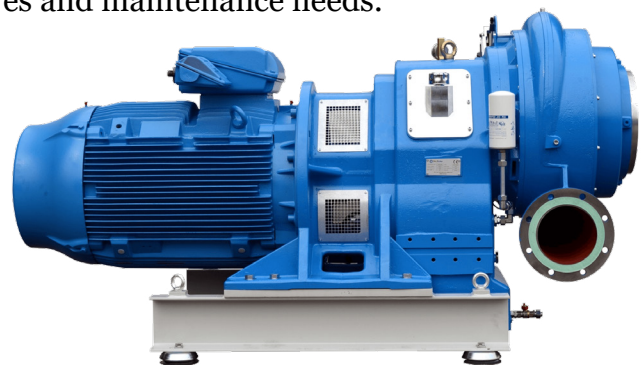
maximize performance while minimizing energy consumption and lifecycle costs.

The Technology Behind Next Turbo Blowers

At the heart of every Next Turbo blower lies a blend of innovative aerodynamic design and intelligent control mechanisms. The product portfolio includes two main series:

GTB Series:

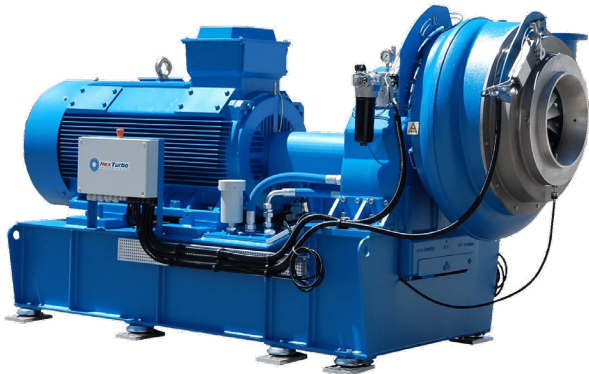
A compact, integrated, and highly efficient model designed for drive powers up to 500 kW. It features a reduced lubrication oil reservoir, integrated oil distribution, and hybrid ceramic bearings, which significantly reduce energy losses and maintenance needs.



in Florian Adam
(Sales Director)

GTH Series:

Built for larger airflows, extending up to 2,000 kW now, this series incorporates hydrodynamic tilting pad bearings and a robust oil system housed within a baseframe configuration.



Each blower can be delivered in compact plug-and-play enclosures or modular acoustic packages, allowing flexibility during installation and seamless integration into existing blower rooms.



Variable Diffuser Vanes and Inlet Guide Vanes: Smart Air-flow Control

A defining feature of Next Turbo's technology is its use of Variable Diffuser Vanes (VDV) and Inlet Guide Vanes (IGV) — mechanisms that precisely control airflow without reducing blower efficiency.



The VDV system regulates the airflow from 40% to 100% of the design value at constant drive speed, maintaining steady pressure without requiring a Variable Frequency Drive (VFD). Meanwhile, the IGV system adjusts air pre-rotation based on ambient conditions, optimizing performance even under fluctuating temperatures and humidity.

Together, these systems allow the blower to deliver the widest operational range with minimal energy loss, setting a benchmark for energy efficiency in the wastewater sector.

What Makes Next Turbo Blowers Different?

Unlike most blowers on the market, Next Turbo products are manufactured in Italy using advanced production technology and stringent quality standards. They combine higher efficiency with lower overall cost, providing plant operators with a long-term, economically viable solution.

The key differentiator lies in the airflow control mechanism. While traditional blowers rely on VFDs to adjust air volume — a method that significantly reduces blower efficiency at reduced speeds and increases capital costs — Next Turbo employs movable vanes to open or close according to the required airflow.

This not only maintains efficiency across varying loads but also eliminates the energy losses associated with VFD-based systems, making the operation both technically superior and cost-effective. This innovative design approach ensures that wastewater treatment plants can precisely

**reliable**

a proven technology

efficient

PLC-based intelligent optimization

versatilewide pressure-constant flow
regulation**non-proprietary**

IEC Motors, Bearings and PLC

minimal maintenance

serviceability on the plant

**long life bearing**

hybrid ceramic or hydrodynamic

integrally-gear

compact and robust design

inlet guide vanes

efficiency optimization

diffuser vanes

100-40% wide flow control

custom milled impeller

forged Aluminium alloy

manage aeration needs while reducing energy consumption and maintenance expenses, which are among the most critical cost factors in plant operation.

Designing for Serviceability and Longevity

Next Turbo's blowers are engineered with a strong emphasis on maintenance simplicity and reliability. Routine servicing can be performed by trained plant staff after initial onboarding, reducing the dependency on external maintenance teams.

Moreover, the company offers comprehensive after-sales services, including:

- Preventive and long-term maintenance contracts
- Condition-based maintenance and remote monitoring
- Original spare parts availability
- On-site troubleshooting and repairs
- Installation, commissioning, and training programs

Through these services, Next Turbo ensures that each installation continues to operate at peak efficiency throughout its lifetime, providing unmatched operational reliability and peace of mind to end-users.

A Global Commitment to Sustainable Performance

With its growing international footprint, Next Turbo continues to champion sustainability, energy optimization, and technological advancement in wastewater treatment. By offering blowers that combine intelligent design, superior efficiency, and proven reliability, the company plays a vital role in helping industries and municipalities meet modern energy and environmental standards.

Each unit represents more than just a machine — it's a commitment to smarter, cleaner, and more sustainable air solutions.

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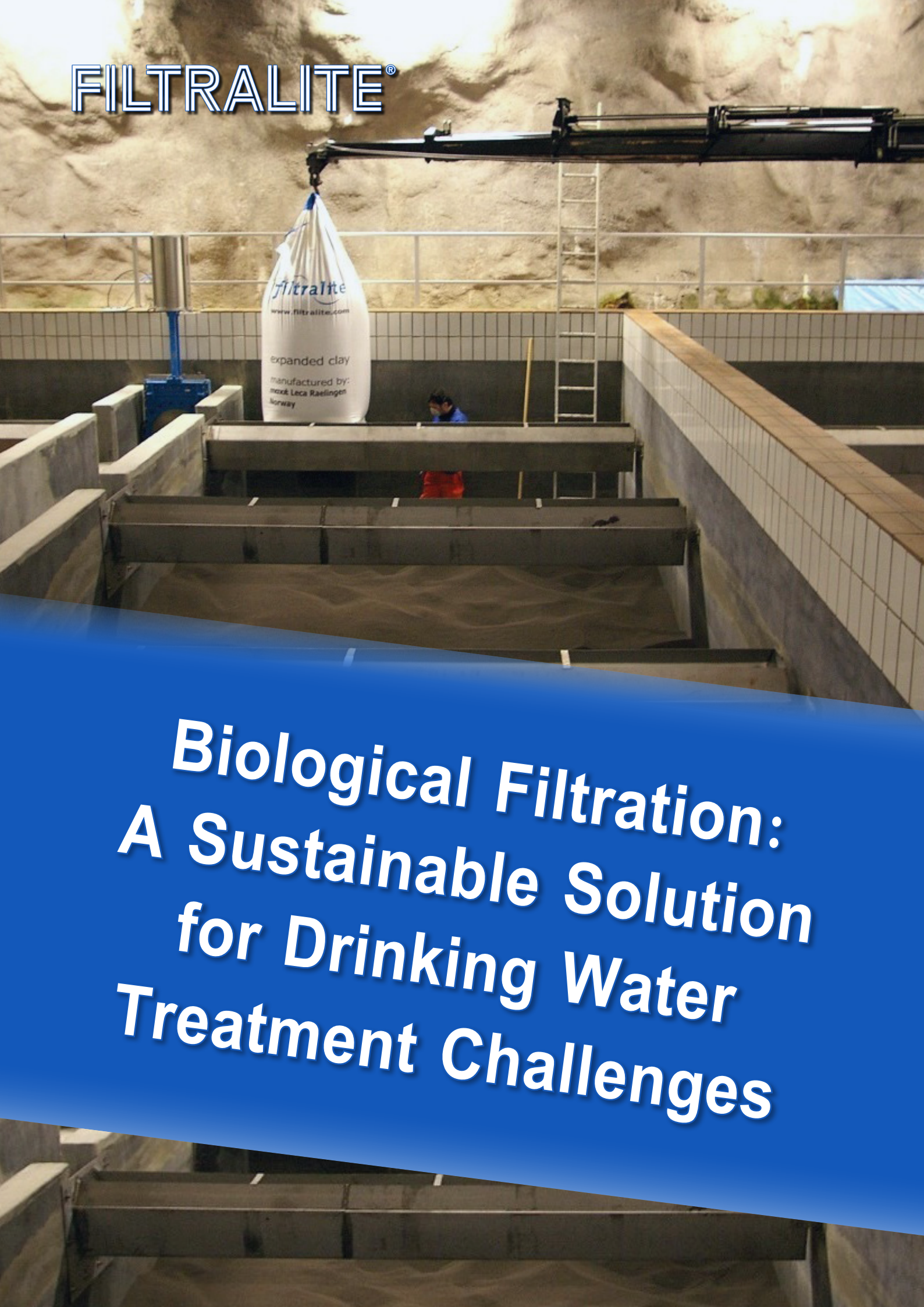
Smart Sustainability for Water & Energy

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The background image shows an industrial water treatment facility. A large white bag of Filtralite expanded clay is being lifted by a crane. The bag has the Filtralite logo and text: "www.filtralite.com", "expanded clay", and "manufactured by: mosk Leca Raellingen Norway". A worker in a blue jacket and red pants is visible in the background near a ladder. The facility has concrete walls and metal railings.

FILTRALITE®

**Biological Filtration:
A Sustainable Solution
for Drinking Water
Treatment Challenges**

As global populations expand and urbanization accelerates, ensuring access to safe and clean drinking water has become one of the most critical global challenges. The growing demand for potable water, combined with the degradation of natural sources, is pushing utilities and industries to seek more advanced and sustainable treatment technologies.

Limitations of Conventional Treatment

Traditional water treatment methods such as chlorination and chemical oxidation are effective for basic disinfection but have notable limitations. They often involve high operational and maintenance costs, generate harmful disinfection by-products, and are less effective in removing pollutants like ammonia, organic matter, and dissolved nutrients. These drawbacks have increased the need for more sustainable, efficient, and cost-effective alternatives.

The Rise of Biological Filtration

Biological filtration (biofiltration) has emerged as a powerful solution to these challenges. This process uses naturally occurring microorganisms that grow on a filter medium to break down organic matter, convert ammonia into less harmful compounds, and reduce turbidity all without relying heavily on chemicals. The result is cleaner, safer water produced through a natural, biological process that supports both water quality and environmental sustainability.

Filtralite® Pure: Redefining Drinking Water Filtration

At the forefront of this innovation is Filtralite® Pure, a specialized biofiltration media developed by Filtralite®, a leading European brand known for high-performance filtration solutions. Made from expanded clay aggregates, Filtralite® Pure combines lightweight structure, exceptional porosity, and long-term durability, creating

an ideal environment for biofilm growth and efficient pollutant removal. Filtralite® Pure is designed specifically for drinking water treatment and desalination applications, providing stable performance, longer filter runs, and reduced backwash frequency compared to conventional sand or anthracite filters.

NC 1.5-2.5

Particle Size Range	1.5 - 2.5 mm
Bulk Density (Dry)	30 lbs/ft ³
Particle Density (Apparent)	65 lbs/ft ³



HC 0.8-1.6

Particle Size Range	0.8 - 1.6 mm
Bulk Density (Dry)	53 lbs/ft ³
Particle Density (Apparent)	106 lbs/ft ³



HC 2.5-5.0

Particle Size Range	2.5 - 5 mm
Bulk Density (Dry)	53 lbs/ft ³
Particle Density (Apparent)	97 lbs/ft ³



NC 0.8-1.6

Particle Size Range	0.8 - 1.6 mm
Bulk Density (Dry)	32 lbs/ft ³
Particle Density (Apparent)	78 lbs/ft ³



“Filtralite® media are produced in several grades and particle sizes to suit different treatment goals. From lightweight, highly porous NC grades ideal for biological filtration, to denser HC types designed for deeper and faster filtration, each variant ensures reliable performance and adaptability to diverse water qualities.”

Case Study: Filtralite® Core Bio-filtration at Putatan II Drinking Water Treatment Plant

• Project Overview

Located in Metro Manila, the Putatan II Drinking Water Treatment Plant was developed to supply safe and reliable drinking water to over one million residents. With a production capacity of 150,000 m³ per day, the facility plays a crucial role in addressing the region's growing water needs.

The plant sources its water from Laguna de Bay, a highly polluted lake affected by urban runoff, industrial effluents, and agricultural discharge. This raw water poses major challenges, including high turbidity, elevated ammonia concentrations (up to 7 mg/L), and occasional salinity.

• Design Challenges and Requirements

Key constraints included limited land, highly variable raw water quality, and the need for a stable, low-chemical process. To meet these demands, engineers selected an aerated biological filtration (BAF) system incorporating Filtralite® HR 3–6, part of the Filtralite® Core range. This media was chosen for its exceptional porosity, mechanical strength, and proven capability in ammonia and organic removal.



• Treatment Process

The treatment line combines several advanced processes to ensure high-quality output:

- 1. Screening:** removal of large solids
- 2. Pre-coagulation and flocculation:** aggregation of fine particles
- 3. Dissolved Air Flotation (DAF):** separation of suspended matter
- 4. Post-DAF Coagulation:** additional clarification
- 5. Aerated Biological Filtration (BAF):** key stage using Filtralite® media for ammonia and organic removal
- 6. Ultrafiltration and Reverse Osmosis:** polishing and salinity control
- 7. Final Disinfection:** ensuring microbiological safety





The BAF unit includes 14 biofilters (12 operating + 2 standby) running in an upflow configuration with a hydraulic loading rate of 10.5 m/h, reaching 12 m/h during backwashing—providing compact design and superior performance compared to conventional sand filters.

• Performance and Results

Using Filtralite® HR 3–6, the Putatan II plant achieved outstanding operational results:

1. Ammonia Removal: Effluent levels consistently below 0.1 mg/L ($\approx 90\%$ removal).

2. Organic Matter and Solids Reduction: Influent BOD (6–10 mg/L) and TSS (~ 100 mg/L) reduced to below 2 mg/L and 5 mg/L, respectively.

3. Operational Benefits: Lower chlorine demand, reduced OPEX, and minimized formation of harmful by-products.

4. Sustainability Impact

By adopting Filtralite® Core biofiltration technology, the Putatan II plant demonstrated how sustainable filtration solutions can deliver both high efficiency and environmental responsibility. The use of Filtralite® Pure and Core media enabled a high-capacity system within a limited footprint, while reducing energy and chemical consumption making it a model for future eco-efficient drinking water treatment plants worldwide.

Conclusion

The pressing challenges of water scarcity and pollution highlight the urgent need for innovative treatment solutions. Traditional methods often struggle with high operational costs and inefficiencies in removing specific contaminants.

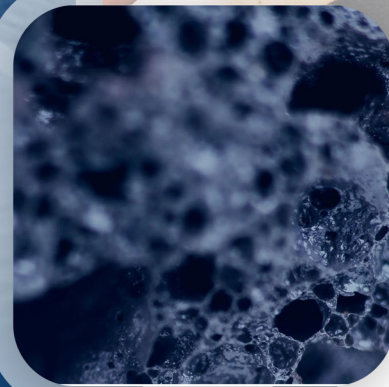
The Putatan II Drinking Water Treatment Plant exemplifies the advantages of biological filtration using Filtralite® Pure media. This advanced system effectively addressed the complexities of polluted raw water from Laguna de Bay, achieving impressive reductions in ammonia and organic matter. With ammonia levels consistently below 0.1 mg/L and significant decreases in BOD and TSS, the plant demonstrates the effectiveness of biological filtration in producing high-quality drinking water.

Additionally, the operational benefits, such as reduced chlorine demand and lower costs, underscore the economic viability of this technology. By minimizing chemical usage and energy consumption, Filtralite® Pure not only enhances water quality but also promotes environmental sustainability, serving as a model for future water treatment initiatives worldwide.

Filtralite® — Smarter. Cleaner. Sustainable.

Redefining Drinking Water Filtration

Developed from high-quality expanded clay aggregates, Filtralite® Pure offers a new generation of biofiltration media.



Why Choose Filtralite®?

Exceptional Porosity

Supports rapid biofilm growth and efficient removal of ammonia, organic matter, and suspended solids

Extended Filter Runs

Longer operational cycles with reduced backwash frequency — saving water, energy, and maintenance time.

Lightweight & Durable

Easy to handle and install, yet mechanically strong for long-term stability in large treatment systems.

Chemical-Free Process

Enables natural purification with minimal chemical use, lowering OPEX and environmental impact.

Proven Results

At the Putatan II Drinking Water Treatment Plant (Philippines), Filtralite® HR 3–6 achieved:

- >90% ammonia removal (effluent <0.1 mg/L)
- BOD reduced from 6–10 mg/L to <2 mg/L
- TSS reduced from ~100 mg/L to <5 mg/L





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Engineering Excellence: Inside Al Mousa Trading Co.'s Global Partnerships and Local Impact

In the heart of Saudi Arabia's transformation journey, where innovation and sustainability form the core of national progress, Al Mousa Trading Co. stands as a symbol of engineering reliability and technical excellence. For the past decade, the company has played a leading role in shaping the Kingdom's water, HVAC, and energy sectors delivering solutions that blend global expertise with local understanding.

A Strong Foundation of Reliability

Founded with a vision to deliver world-class engineering solutions to the Saudi market, Al Mousa Trading Co. has grown to become one of the country's most trusted names in pumping, HVAC, energy, and water treatment systems. From its earliest days, the company understood that reliability is not just a feature it's the foundation of long-term partnerships.

A Diverse Range of Engineering Solutions

Today, Al Mousa's portfolio covers a wide spectrum of specialized solutions, including: **Water Pumping Systems:** Submersible, booster, circulation, chillers, air handling units, sewage, stormwater, treatment, and firefighting pumps.



Energy & Heating Solutions: Boilers, calorifiers, solar heating systems, and heat pumps.

Filtration & Water Treatment: Multimedia filters, copper-silver ionization, and filtration media such as Filtralite.

Piping Systems: PPR, HDPE, PEX, and acoustic soil & waste systems.



Swimming Pool & Water Features Solutions

Through this diverse range, Al Mousa ensures that every system — whether for a hospital, commercial building, industrial plant, or infrastructure project performs with efficiency, sustainability, and precision.

Partnerships That Reflect Quality

A defining feature of Al Mousa's success lies in its strategic partnerships with internationally recognized brands. The company proudly collaborates with world leaders such as:

- Grundfos
- SPP Pumps
- Viessmann
- Aliaxis
- Aquaterra
- Stalwart, and many more
- Wilo
- Peerless
- Balmoral Tanks
- Filtralite
- Unidelta

Each partnership represents a shared commitment to engineering excellence and sustainable progress. Through these alliances, Al Mousa brings global technology to Saudi infrastructure, ensuring that every product and solution meets the highest international standards.

Notable Projects

These collaborations have allowed Al Mousa to play a key role in some of the Kingdom's landmark projects, including:

- Roshan City
- Royal Commission projects in Jubail and Yanbu
- Jeddah Airport's sewage treatment plant
- King Abdullah Park
- Many more prestigious projects

Each project is a testament to Al Mousa's system integration capability — the ability to bring together pumps, piping, filtration, and HVAC systems into one cohesive, high-performance solution. By providing not only products but also engineering design support, selection advice, and technical after-sales service, the company ensures optimal functionality and long-term reliability.



Performance Speaks Volumes

- **SPP UL/FM firefighting pumps:** ensuring safety in high-rise buildings
- **Grundfos booster systems:** maintaining water pressure in modern residential complexes
- **Chilled water systems:** enhancing hospital efficiency

Al Mousa Trading's engineering excellence speaks through performance.



Local Expertise Meets Global Standards

What truly sets Al Mousa apart is its commitment to combining international quality with local expertise. The company's technical teams undergo continuous training with its global partners, ensuring they remain up to date with the latest innovations in pump efficiency, water treatment technologies, and HVAC design.



Knowledge Sharing and Localization

This knowledge-sharing culture enables Al Mousa to localize international best practices and develop solutions that fit the Saudi climate, building standards, and sustainability targets.

Every system installed or supplied by Al Mousa reflects a careful balance between engineering precision and practical adaptability.

Moreover, the company's engineering and sales divisions work closely with consultants, contractors, and facility owners from the early stages of a project ensuring that every solution is efficient, cost-effective, and sustainable over its life cycle.

Looking Toward the Future

As Saudi Arabia accelerates its investment in infrastructure, renewable energy, and sustainable water management, Al Mousa Trading Co. remains steadfast in its mission to deliver world-class technologies and maintain the trust it has earned over decades.

With a growing team of engineers, expanding facilities, and ongoing collaboration with global leaders, Al Mousa continues to set new benchmarks for quality, service, and technical excellence. Its strength lies not only in its products but in the relationships it builds and the solutions it delivers solutions that continue to move the Kingdom toward a more efficient and sustainable future.

Conclusion

Al Mousa Trading Co. stands as a beacon of engineering excellence in Saudi Arabia's evolving infrastructure landscape. By forging strategic partnerships with global leaders, the company enhances its offerings while ensuring they meet local needs. Its diverse portfolio spans water, HVAC, and energy sectors, reflecting a strong commitment to sustainability and efficiency. Landmark projects throughout the Kingdom demonstrate Al Mousa's capability to deliver integrated solutions that drive progress. As Saudi Arabia invests in renewable energy and sustainable practices, Al Mousa is well-positioned to lead the way, reinforcing its reputation as a trusted partner for a more efficient future.





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AL-MOUSA TRADING COMPANY

Al-Mousa Trading CO. provides innovative water and energy solutions for industrial and commercial sectors in Saudi Arabia and beyond, partnering with leading global brands to deliver reliable, efficient, and sustainable systems.

P R O D U C T S



Grundfos Water Pumps



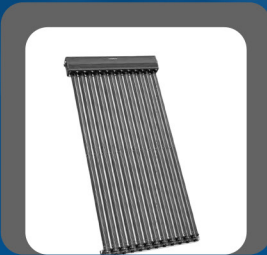
Viessmann Boilers



SPP Fire Pumps



Peerless Fire Pumps



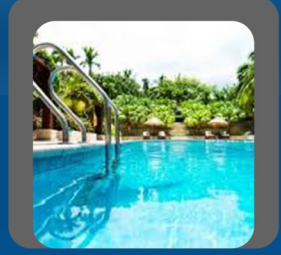
Viessmann Solar Panels



Wilco Water Pumps



Viessmann Heat Pumps



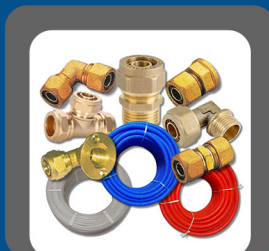
Pentair Swimming Pools



Filtralite® Clean

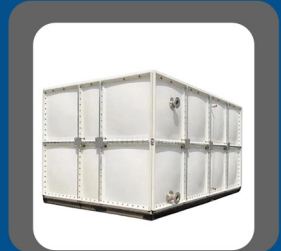


Filtralite® Pure



PIPES & FITTINGS

ALIAxis/STALWART/UNIDELTA/
AQUATERRA/DOHA REGIONAL



TANKS

STALWART/BALMORAL

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Orascom Construction PLC: Our Impact Transcends Borders



Orascom Construction PLC is a leading global engineering and construction contractor focusing on infrastructure, industrial, and high-end commercial projects in the Middle East, Africa, and the United States. The Group also develops and invests in concessions, owns 50% of Europe-based BESIX Group, and holds a portfolio of subsidiaries across building materials, facility management, and equipment services. Consistently ranked among the world's top contractors, Orascom Construction has a consolidated backlog of USD 9.6 billion and is dual listed in the UAE and Egypt.

History, Vision & Mission

Founded in 1950 by the late Eng. Onsi Sawiris, Orascom Construction began its journey as a small contracting company in Egypt. From these humble beginnings, the Group grew steadily, eventually establishing itself as a global player in engineering and construction.

Orascom Construction's vision is to be a world-class leader in engineering and construction, committed to delivering innovative, sustainable, and high-quality projects. Its mission is built upon creating long-term value for shareholders, developing the communities it serves, and maintaining the highest standards of health, safety, and environmental responsibility.

The company's growth story is anchored in a strategy based on four pillars: consolidating its leadership in the construction sector, leveraging partnerships, expanding its investments and operations & maintenance (O&M) portfolio, and sustaining excellence across all areas of activity.

Our Brands

Orascom Construction PLC operates through a diversified portfolio of businesses and partnerships that extend its global reach and reinforce its position as a leader in engineering and construction. The Group's activities are structured into key geographic and operational segments:

- **Orascom Construction:** A prominent EPC contractor in the Middle East and Africa with a business legacy spanning more than seven decades.

- **Orascom Construction USA:** Operating through its subsidiaries The Weitz Company and Contrack Watts, OC USA is a full-service construction company, general contractor, design builder, and construction manager. Together, these entities bring nearly 170 years of experience and operate across the United States.

- **BESIX Group:** Orascom Construction PLC owns a 50% stake in the Belgium-based BESIX Group, a leading construction company with operations across Europe, the Middle East, Africa, and Australia.



Global Track Record

Orascom Construction's leadership and consistent performance have earned it recognition on the world stage. In ENR's 2025 Global Rankings, the company achieved:

- #40 – Top 250 International Contractors
- #127 – Top 250 Global Contractors
- #10 – Top Firms in Africa
- #5 – Top Firms in Telecommunications Worldwide



Subsidiaries & Investments

Orascom Construction PLC maintains a diverse portfolio of subsidiaries and strategic investments that complement its core construction business and expand its capabilities across multiple sectors. These investments strengthen the Group's integrated model and ensure long-term sustainable growth while delivering world-class quality.

Company	Ownership (%)	2024 Revenue (USD mn)*
National Steel Fabrication (NSF)	100%	50.3
Integrated Façade Solutions	100%	14.3
Orascom Services	100%	40.3
United Holding Company	56.5%	13.9
National Pipe Company	40%	75.3
Contrack Facilities Management (CFM)	100%	24.0
Orascom Industrial Parks	60.5%	14.2

Contrack Facilities Management

Established in 2004, Contrack Facilities Management S.A.E. (CFM) is a wholly owned subsidiary of Orascom Construction and stands as a premier integrated services provider in Egypt, specializing in a comprehensive range of cleaning, security, and repair services tailored for commercial buildings. Leveraging advanced technology and high-value machinery, CFM is dedicated to enhancing operational efficiency for its clients.

Originally created to service the dual 34-story Nile City Towers on Corniche El Nile, Cairo, CFM has expanded its footprint significantly, now delivering top-tier services to commercial establishments across Egypt. The company has established itself as the leading player in the country's facilities management sector.

CFM offers a broad spectrum of hard services such as engineering, fit-outs, civil and architectural repairs, and maintenance.



It complements these with soft services that encompass housekeeping, janitorial services, and deep cleaning, while also excelling in specialized areas like façade cleaning, landscaping, pest control, waste management, and recycling.

The company's impressive client portfolio spans various sectors, including industrial, banking, healthcare, retail, real estate, and water treatment plants. CFM has long-standing partnerships with notable entities such as the Children's Cancer Hospital Egypt 57357, Cairo Festival City Mall, Credit Agricole, the Central Bank of Egypt, Emirates NBD, Alshaya Group, and Dar El Handasa.

Company Activities & Services

Orascom Construction operates across a wide spectrum of industries, providing end-to-end solutions that span the entire project lifecycle. Its business lines include:

- **Construction:** Execution of large-scale infrastructure, industrial, and high-end commercial projects for both public and private clients in the Middle East, Africa, and the United States.
- **Concessions & Investments:** The Group develops and invests in infrastructure assets, creating new construction opportunities and long-term shareholder returns. We capitalize on our investment and financing track-record across various sectors, encompassing several industries such as cement, fertilizers, ports, renewable energy and water treatment.



- **Operations & Maintenance (O&M):** Orascom Construction PLC has built a strong track record in the Operation & Maintenance (O&M) sector and has secured multiple multi-year O&M contracts for projects where the Group also serves as the contractor. Current O&M contracts span several sectors, including water treatment, wastewater treatment, water desalination, and transportation.
 - **Building Materials:** The company holds a portfolio of construction materials and investment companies that complement the Group's core activities, including manufacturers of fabricated steel products, glass curtain walling, paints and concrete pipes as well as an industrial free zone and two facility management companies.
 - **Equipment Services:** Orascom Services, a subsidiary of Orascom Construction PLC, is a leading player in Egypt's equipment importation, distribution, and services sector. Established over 30 years ago by the late Eng. Onsi Sawiris, the company has built a strong reputation as a trusted agent for world-class Original Equipment Manufacturers (OEMs).
- This integrated model enables Orascom Construction to remain a trusted partner, capable of delivering projects that meet the highest international standards.

Global Track Record

Orascom Construction

• Magdi Yacoub Global Heart Center

The largest regional center for cardiac care, research, and training.

• Egypt International City Olympic Stadium

The largest stadium in the Middle East with a seating capacity of over 92,000 spectators.

• East of Nile Monorail

The world's longest monorail transit project.



• Grand Egyptian Museum

The largest archaeological museum in the world, constructed in collaboration with BESIX (50% owned).

• New Delta Wastewater Treatment Plant

The world's largest of its kind, winner of four Guinness World Records.



• 650 MW Wind Farm

The largest operational wind farm in the Middle East & Africa, completed ahead of schedule.



OC USA

- Kansas City International Airport
- Confidential Data Center, Des Moines, Iowa (USA)

ORASCOM | **USA**
CONSTRUCTION



BESIX

- Sheikh Zayed Bridge (UAE)
- Sheikh Zayed Grand Mosque (UAE)



Corporate Social Responsibility

Corporate Social Responsibility (CSR) is integral to the company's identity. Orascom Construction is committed to supporting education, healthcare, youth empowerment, and entrepreneurship. Through these initiatives, the Group actively contributes to building a brighter, more sustainable future for the communities it serves.



Contact Information

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Email: info@orascom.com

Website: www.orascom.com



**REC
SOLAR**

**REC Solar: Introduces
a New Power Paradigm
for Wastewater
Utilities with Cost
Effective PPAs**



Wastewater treatment utilities face significant challenges in balancing cost efficiency, operational reliability, and environmental sustainability. One promising solution is adopting Power Purchase Agreements (PPAs), which enable facilities to integrate renewable energy such as solar power without upfront capital costs. PPAs provide long-term energy savings, grid resilience, and carbon emission reductions, making them ideal for wastewater plants with available space for solar arrays. We explore the benefits of PPAs, key considerations for implementation, and real-world success stories. From financial advantages to regulatory pathways, PPAs offer a scalable strategy for utilities to meet sustainability goals while maintaining cost-effective operations.

Power purchase agreements are a cost-effective and sustainable solution for wastewater treatment utilities

One of the most significant (and numerous) difficulties that wastewater treatment utilities face is keeping costs low and operations running in the most ecologically responsible manner feasible. A power purchase agreement (PPA) is one potential solution for addressing all three. PPAs are becoming an increasingly popular way to finance and develop renewable energy projects in a variety of well-suited facilities, but wastewater treatment plants are particularly good prospects.

Perhaps the most appealing aspect, particu-

larly in terms of viability, is that there is no capital

investment for installing the equipment—namely solar panels. To delve deeper into the concept, I spoke with Sage McLaughlin, REC Solar's business development manager, who has 15 years of experience in the energy industry and decarbonization, having worked at Trio (formerly Edison Energy) and Duke Energy.



What conditions must be met for a wastewater facility to be a viable contender for solar energy, in particular?

Wastewater facilities are excellent candidates for solar when they have accessible space that can be imaginatively utilized for an array, such as rooftops, land, or parking lots. A favorable policy environment is always beneficial, but with REC Solar's PPA model, consumers do not need to negotiate policy themselves. For example, in California, combining solar and storage is a no-brainer under Net Energy Metering 3.0, often known as the Net Billing Tariff. For many facilities, the value goes beyond saving money and into meeting sustainability goals, like California's 2045 target for carbon neutrality or the reduction of Scope 2 emissions [indirect greenhouse gas emissions associated with the purchase of electricity, steam, heat, or cooling].

Are there any dangers to avoid to ensure success?

When adopting solar energy, it is important to work with experienced partners who understand local regulations and procurement processes to ensure smooth project execution. Organizations should also consider future site plans, such as expansions or operational changes, to avoid conflicts with solar installations. Finally, assessing energy needs and available space early on helps ensure the project remains practical and cost-effective over the long term.

The ecology and community definitely benefit, but could you provide an example?

A prior project in California with the Central Contra Costa Sanitary District (Central San) on a 2.16-megawatt (MW) solar array reduced carbon dioxide emissions by 1,865 metric tons per year, which is equivalent to removing 444 gasoline-powered vehicles from the road. By switching to this financing approach, Central San expects to save approximately \$6 million in electricity expenditures throughout the system's lifetime.

Benefits of Power Purchase Agreements

PPAs offer several benefits for both electricity generators and buyers:



Risk Mitigation

PPAs provide revenue certainty for electricity generators, reducing the financial risks associated with project development and operation. Buyers benefit from long-term price certainty, shielding them from volatility in energy markets.

• Support for Renewable Energy Development

PPAs play a crucial role in facilitating the development of renewable energy projects by providing developers with a stable revenue stream, thus encouraging investment in clean energy infrastructure.

• Cost-Effectiveness

By locking in favorable electricity prices over the long term, PPAs can result in cost savings for buyers compared to traditional utility tariffs, contributing to improved financial performance and competitiveness.



Conclusion

Power Purchase Agreements (PPAs) present a cost-effective, sustainable solution for wastewater treatment plants, allowing them to adopt solar energy with no upfront costs. PPAs lock in predictable energy rates, reduce reliance on the grid, and help facilities meet decarbonization targets. Key requirements include available space (rooftops, land) and supportive policies, though providers like REC Solar simplify the process. Case studies, such as a 2.16 MW solar project in California, demonstrate millions in savings and significant emissions reductions. Challenges include long-term planning and stakeholder alignment, but with expert partners, PPAs can transform energy management for utilities. This model aligns financial, operational, and environmental priorities, offering a scalable path toward cleaner, more resilient infrastructure.





AquaEnergy Expo

M a g a z i n e

Blue | Green | Sustainable | Smart



WATER NEWS BRIEF

November| 2025

www.aquaenergyexpo.com

Veolia to operate Chile's first municipal and industrial desalination plant in Valparaíso

Veolia has secured the operation and maintenance contract for the Aguas Pacífico desalination plant in Valparaíso, Chile, which will supply both municipal and industrial water at a capacity of 1,000 liters per second. The contract, awarded after a competitive tender, lasts up to four years with potential extensions until 2040. The plant will operate on renewable energy, prioritize local employment, and serve drought-affected communities. Aguas Pacífico retains ownership and responsibility for the facility, while Veolia aims to enhance ecological transformation through innovative water and energy management solutions.



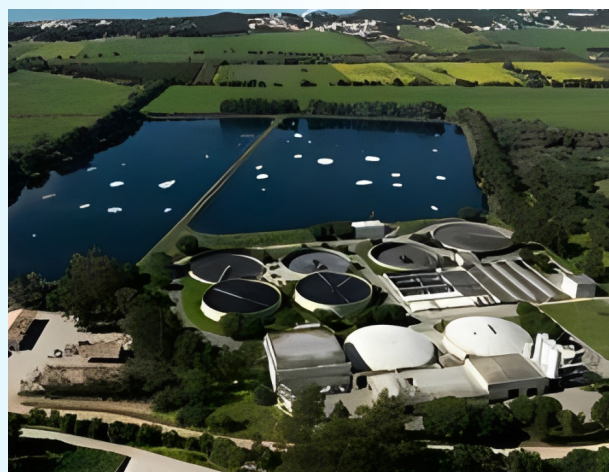
Xylem raises its forecasts after 8% growth driven by demand for smart water solutions



Xylem Inc. reported Q3 2025 revenue of \$2.3 billion, an 8% increase year-over-year, with adjusted EPS at \$1.37, up 23%. The adjusted EBITDA margin expanded to 23.2%, driven by cost control and productivity gains. All divisions saw growth, particularly Measurement & Control Solutions (11% organic) and Water Solutions & Services (10% organic). Following strong performance, Xylem raised its full-year 2025 guidance to approximately \$9 billion in revenue, with adjusted EPS expected between \$5.03 and \$5.08. The company remains focused on sustainable growth and innovation despite potential macroeconomic challenges.

Acciona is awarded the operation and maintenance of twelve wastewater treatment plants in Portugal

Acciona has secured a seven-year contract, potentially extendable for three more, to operate and maintain twelve wastewater treatment plants (WTPs) in Alto Minho, Portugal, valued at €11.78 million. The facilities serve over 108,000 people and include 66 pumping stations and 144 kilometers of pipework. Acciona plans to implement sustainability measures to reduce waste, reagent use, and energy consumption. This marks acciona's first contract with Águas do Norte. The company has extensive experience in Portugal, having constructed over 30 water-related projects, including significant wastewater and drinking water plants.



K-water and OpenAI collaborate on AI-based water management and climate forecasting

The Korea Water Resources Corporation (K-water) and OpenAI have announced a partnership to improve global water management and predict extreme weather events, such as floods and droughts. Their initiatives include developing a large language model for water applications, creating a climate change forecasting platform, and designing an AI-based global water purification model. K-water CEO Yun Seog-dae highlighted their commitment to safeguarding water and AI as universal resources. With over 60 years of experience and processing 7.4 billion data points daily, K-water aims to integrate AI into its systems, seeking sustainable solutions amid rising global water stress.



Abu Dhabi DoE, Space42 partner on AI and satellite solutions for water and energy



The Abu Dhabi Department of Energy (DoE) has signed a Memorandum of Understanding (MoU) with Space42, a UAE-based AI-powered SpaceTech firm, to enhance sustainable energy and water management through geospatial and AI solutions. The agreement outlines cooperation in developing advanced technologies to improve the resilience and efficiency of Abu Dhabi's infrastructure. Space42 will provide satellite imagery and geospatial AI solutions for better monitoring and decision-making. The partnership will also explore integrated systems for electricity, water, and cooling networks, aiming to align with the UAE Energy Strategy 2050 and enhance climate resilience and water security in the emirate.

Lantania launches operations in Italy and Turkey with €108 million in water and energy projects

Lantania is expanding its international presence with €108 million projects in Italy and Turkey. In northern Italy, the company will build three photovoltaic parks near Bologna, totaling 80 MW with a €35 million investment. In Turkey, Lantania, in partnership with Özaltın İnşaat, will enhance the Ankara drinking water treatment plant for €73 million, boosting its capacity to 2,226,000 m³/day. These initiatives are part of Lantania's growth strategy in high-potential markets and will include new solar projects in Italy by mid-2026, reinforcing its commitment to sustainable development and reducing carbon emissions.



Global Water Events



All Ireland Water & Wastewater Expo

All Ireland Water & Wastewater Expo

Date: 4 December, 2025

Location: Leopardstown Pavilion, Leopardstown Racecourse, Foxrock, Dublin 18, D18 C9V6, Ireland

The All-Ireland Water & Wastewater Expo is a one-day conference uniting stakeholders to discuss key issues in the water sector. With €6 billion allocated through 2026, investments will enhance infrastructure and treatment facilities. Industries face rising demands for high-quality water, driving investments in efficiency and sustainability initiatives.

Website: www.waterengineering.ie



AquaEnergy Expo

Florida, USA

250K+
Followers

60K+

Mailing List



11k+

YouTube
Subscribers



13k+

Telegram
Subscribers



150k+

Facebook
Subscribers



35k+

WhatsApp
Subscribers



38k +

LinkedIn
Subscribers



195+

Countries



900+

Jobs Offers



16

Employees



9.2M+

Products
Views



1200 +

Companies



16300+

Virtual Expo
Products



13K+

References
Knowledge Hub



200+

Webinars
and Courses



1K+

Articles
and News



15k+

Trainee



www.aquaenergyexpo.com



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M a g a z i n e

Blue | Green | Sustainable | Smart

Aqua Energy Expo Jobs platform

Aqua Energy Expo Jobs platform connects immense and diverse talents in the global Water and Energy industry .



www.aquaenergyexpo.com



Nile Industries for Advanced Engineered Products

Founded in 2001, Nile Industries for Advanced Engineering Products has established itself over more than two decades as one of Egypt's leading manufacturers of fiberglass solutions. The company has built a strong reputation for quality, innovation, and reliability, serving a wide range of sectors across Egypt and the Middle East, with continuous expansion into global markets.

Combining engineering excellence with material innovation, the company delivers integrated solutions characterized by durability, lightweight construction, and corrosion resistance making it the ideal choice for various engineering and infrastructure applications.

Areas of Expertise

Nile Industries specializes in the design and manufacturing of advanced composite products that meet the requirements of modern construction, industrial, and infrastructure projects. Key expertise areas include:

• Water and Wastewater Treatment Plants



Fiberglass covers



Grating's walkways



Manhole covers



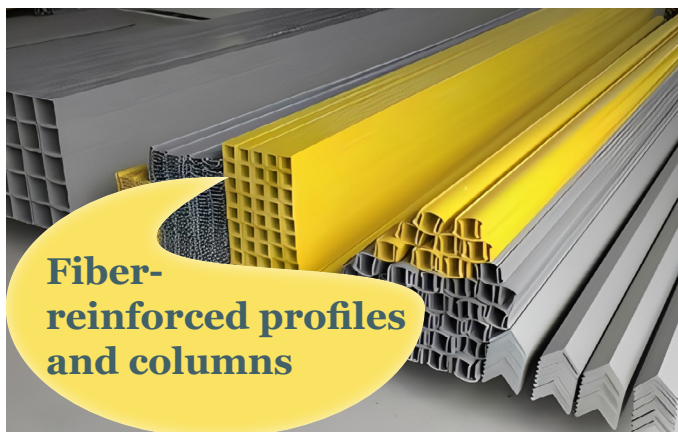
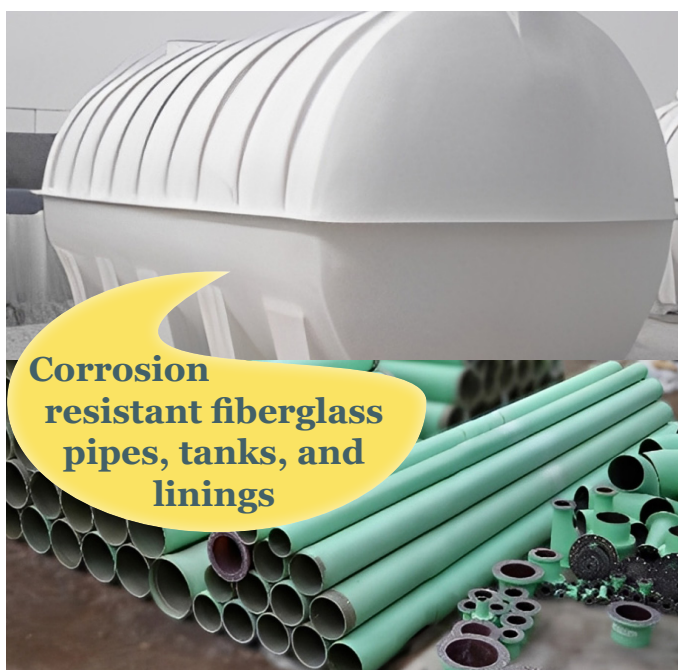
Stairs and marine ladders with safety Cages



Customized architectural elements

**Handrails**

• Industrial and Infrastructure Solutions

**Fiber-reinforced profiles and columns****Corrosion resistant fiberglass pipes, tanks, and linings**

• Engineering and Design Services - Custom product development for architects and contractors

These solutions deliver added value that surpasses traditional metal products in terms of strength-to-weight ratio, corrosion resistance, and reduced long-term maintenance costs.

Key Projects

Over the years, Nile Industries has contributed to numerous prestigious projects across Egypt and beyond, including:

• Four Seasons Hotel (Cairo)

Partnered with **Hyundai Engineering & Construction** to supply customized composite elements meeting the highest standards of quality and luxury.

• New Delta Project:

Agricultural wastewater treatment plant

• New Mansoura Desalination Plant:

Hassan Allam Construction

• Diarb Negm & Abu Kabir Treatment Plants:

EMAC

• Al-Ayyat Water Plant:

Arab Contractors

• Geziret El-Dahab Water Plant:

Hassan Allam Construction

• Arab Organization for Industrialization:

Flooring for mobile desalination plants

• Nissan Motors Factory:

6th of October (maintenance chamber covers)

• Juhayna Dairy Factory:

Production platforms

• Fresh Electric Factory:

Galvanizing workshop covers

• Egypt Coats Paints Factory:

Floor insulation systems

• Palm Hills & New Giza Developments:

Walkways and grating systems for gardens and fountains

• SIDPEC Petrochemicals:

Handrails and cooling tower walkways

• Hurghada & El-Yusr Desalination Plants:

Fiberglass covers and walkways

• Orascom Ports Projects:

Manholes and inspection chambers at yacht marinas

• Major industrial projects:

(Coca-Cola, Eastern Tobacco, Evergrow, Sanmar Port Said, among others).

These projects highlight the company's ability to adapt to diverse requirements and deliver high-performance products on time and within specifications.

Commitment to Quality and Innovation

Nile Industries places the highest priority on continuous quality and innovation through:

- Advanced manufacturing processes ensuring accuracy and consistency.
- Compliance with international quality standards.
- Investment in research and development of sustainable material technologies.
- A customer-focused approach, building long-term partnerships and delivering dedicated technical support

Future Vision

Nile Industries aims to strengthen its position as a regional leader in advanced composite materials, with further expansion into global markets through strategic partnerships, increased exports, and continuous product innovation.

With decades of expertise, a strong track record of successful projects, and a commitment to engineering excellence, the company continues to push the boundaries of innovation by delivering Fiberglass solutions that empower the industries of the future.

Contact Information

Nile Industries for Advanced Engineering Products

- **Website:** www.nileindustries.com
- **Email:** info@nileindustries.com
- **Phone:** +201140707793
- **Headquarters:** Office 40, El-Rashedy tower, next to Diamond mall, 6th of October

Arab Water & Energy Technologies Co. Ltd



Since 1994, our company has been involved in the design and manufacturing of high-quality vertical turbine pumps using rust resistant Stainless Steel, as well as drilling equipment, pipes and accessories, generators, surface pumping sets and water irrigation systems.

The company manufacture horizontal water pumps for irrigation of multiple sizes in cooperation with several European companies specializing in this field. Our technical staff was able to design and develop horizontal pumping sets to be among the largest exporters of this type of pump in Jordan and the Middle East.

The company has a plant located in the capital city Amman- Jordan, equipped with modern technology equipment and a test station for all types of vertical, horizontal, turbine, floating pumps and generators.

The company's policy is to continue its research and development programs using modern scientific methods in processing raw materials and reducing costs, thus increasing production and exports and opening new markets regionally.

Products:

- Horizontal water pumps of various capacities powered by diesel engines or electric motors.
- Turbine vertical water pumps
- Submersible water pumps.
- Generators of different capacities .
- Water irrigation systems and equipment
- Floating Pumps

Solar Powered Products:

In line with preserving the environment and using alternative sources of energy, the company has entered the field of supplying its products powered by solar panels:

- Horizontal water pumps with different capacities.
- Vertical and Submersible Pumps
- Irrigation Systems
- Floating pumps

Other activities

The company was able to find a broad base of suppliers for the various materials required for the Oil, construction, agricultural, power



generation and irrigation industries, importing and distributing many products related:

- Drilling Bits
- Drilling Pipes
- Water & Oil pipes
- High-pressure pumps - Plunger Pumps
- Fixed and mobile drilling rigs
- Specialized trucks, Tanks and cranes
- Pivot irrigation systems and drip irrigation systems.
- Piping and Valve Equipment
- Water, oil and gas meters
- Electrical control panels.
- Specialized Pump for the Oil Industry
- Fire-fighting systems for oil refineries

Representations

Manufacturer	Origin	Products
DEUTZ	Germany	Diesel Engines
POMPE ZANNI	Italy	Water Pumps
HAYDRUS	Cyprus	Water Pumps Accessories
LOMBARDINI	Italy	Diesel Engines
MECCALTE	UK	Alternators
TECNOELETTRA	Italy	Control Panels
STANDART	Turkey	Water Pumps
BIODOS	Germany	Water Treatment
TECOFI	France	Valves
MASSENZA	Italy	Drilling Rigs
ATLAS COPCO	Sweden	Air Vacuum Equipment
BELWETHER	USA	Drilling Heads
McFarland Pump Group	USA	Pressure Pumps
Koster	Germany	Floating Pumps
Indar	Spain	Floating Horizontal Pumps
E-TECH	Italy	Submersible Pumps
Xylem	USA	Floating Vertical Pumps
Flygt Pumps	Sweden	Vertical & Horizontal Pumps
Grundfos	Denmark	Water Pumps
Bombas IDEAL	Spain	Floating Pumps

PRODUCTS & SERVICES

Water Pumping Systems

AWST produces Pumps and complete Water Pumping Sets for different fields of applications.

Main Components are supplied by well-known European producers like Deutz Germany, Kohler – Italy, Hydrus – Cyprus and Pompe Zanni – Italy.

The product range includes:

- Diesel Engine driven Deep Well Turbine Pump sets
- Electric Motor driven Deep Well Turbine Pump sets.
- Electro Submersible Water Pumping sets
- End Suction Irrigation Pumping Sets
- Split Case Irrigation and Municipal Water Pumping Sets

Vertical Turbine & Horizontal Centrifugal Pumps

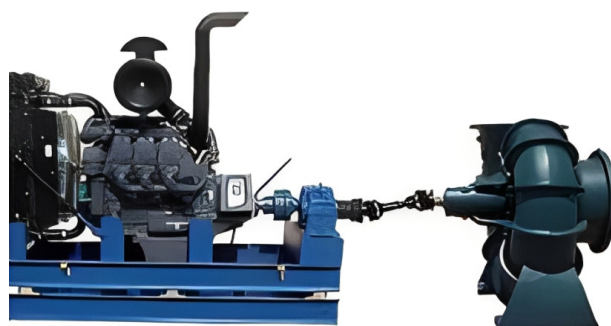




- Diesel and Electric Motor Driven
- Pump Set
- A Unique special design by AWST to meet the requirement of the Ministry of Agriculture of Iraq
- 1250 sets were supplied



Diesel Driven End Suction



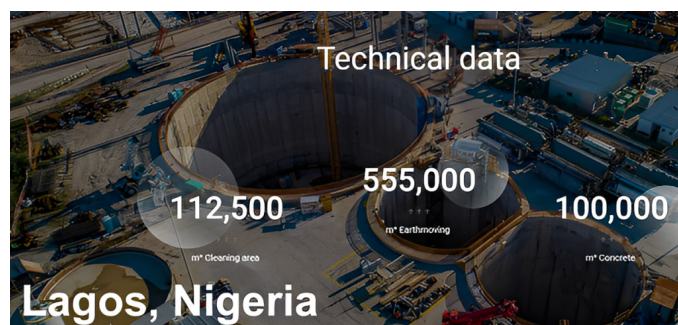
1 m³/sec Pump Irrigation End Suction Pump set

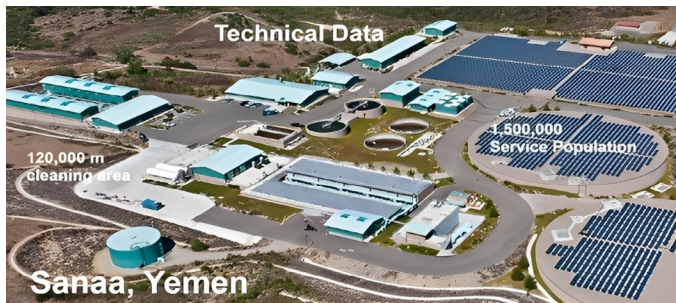


1 m³/Sec Horizontal Split Case Pump Set

Waste Water Treatment Plants (WWTP)

For every city a water solution





Al-Tharthar Pumping Station

Floating Horizontal Electro Submersible Pumps

- 504,000 m³/hr Lake Water
- 2500 kVA Electrical Power
- 3 Months Erection & Commissioning



Floatek[®]

Horizontal Electro Submersible Floating Pumps

We provide fully integrated Pumping solutions for medium supply power source up until sink point. This includes and is not limited to electrical power switch gear, piping, necessary fitting and pumps. We have pioneered floating pumping solutions of horizontal electro submersible floating pumps by design and implementing floating pontoon systems for pumps with flow of 5 m³/s and head of up to 15 m. Al-Tharthar pumping station is currently equipped with our solution with pumps supplying a total of 143 m³/s, the Pump station has 3 generations of pontoon systems pumping in excess of 4.5 billion Cubic meter per annum.

AWST Systems are highly durable, robust, and effective to operate in stringent environments of high temperature, rural areas, and water of various composition.



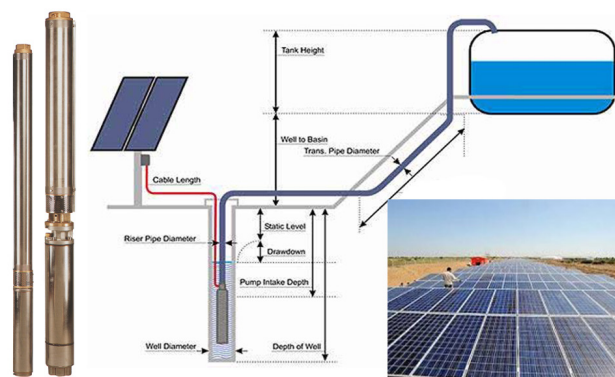




Solar Power Driven Pumps



- Solar Power Driven Vertical Turbine Pumps**
- Capacities – from 6 L/s
 - Head up to 70 m



Solar Power Driven Submersible Pumps

- Capacities 15 – 50 m³/hr
- Head 50 – 100 m



- Types : End Suction, Horizontal Split Case**
- Capacities : Up to 3600 m³/hr**
- Input Power : up to 160 kW**

Floating Pump



Or



Submersible Pumps



Solar Power Driven Water Treatment Plants

- Capacities up to 40 m³/ 8 hrs

Generating Sets

AWST produces a wide range of Diesel Generating sets with a variety of configurations to suit the need of the customers. Our main market is Iraq and thousands of Gensets were supplied to the Ministry of Water Resources.

The Factory produces Gensets of up to 300 kW while larger capacities of up to 2.5 MW can be supplied from our associates in Europe.

The components used are produced by the world best like Deutz- Germany Leroy Somer-France , MeccAlte- UK , Kohler – Italy , Tecnoelatra – Italy.



MATERIAL & EQUIPMENT SUPPLY

Oil Industry Material Supplies



Casing Pipes
Oil and Gas Transmission Pipelines According to API 5L and API 5 CT Grades K55 , J55 . P110 , L80 and N80

Irrigation Systems

With increased scarcity of drinking and irrigation water around the Globe and in increased demand resulting from the Global population growth, the importance of water saving techniques became more evident, and the utilization of the old irrigation techniques that waste huge quantities of precious water became unacceptable and impossible in some areas.

The use of modern scientific irrigation Techniques that provides only the necessary quantities of water became inevitable. Arab Water & Energy Technologies supplies complete irrigation systems including Stationary Sprinkler, Center Pivot, Linear and Drip Irrigation Systems.





Drilling Pipes

According to API 5DP specification levels PSL-1, PSL-2 and PSL-3
Grades: E-75, X-95, G-105 and S-135

Drilling Bits

All kinds of steel or Tungsten Carbide Drill bits like:

- Tricone Roller Bit with sealed Roller
- Tricone Bit with reinforced Gauge protection
- Tungsten Carbide Roller Drill Bits
- Mill tooth Tricone Bits
- PCD Drill Bits

All the above are according to API 7-1 and suitable for different soil formation (soft, medium and hard) all IADC range.

Brands:

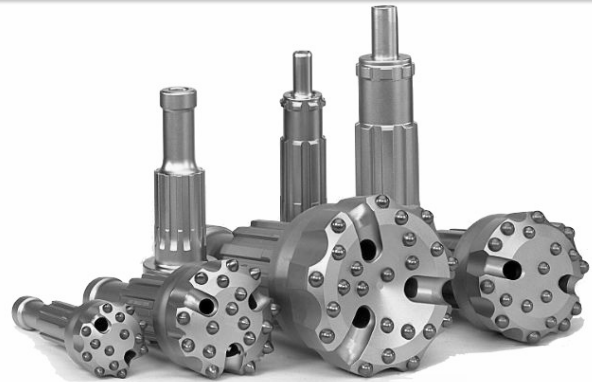
- Atlas Copco
- Baker Hughes
- Varel



DTH Drill Hammers

Brands:

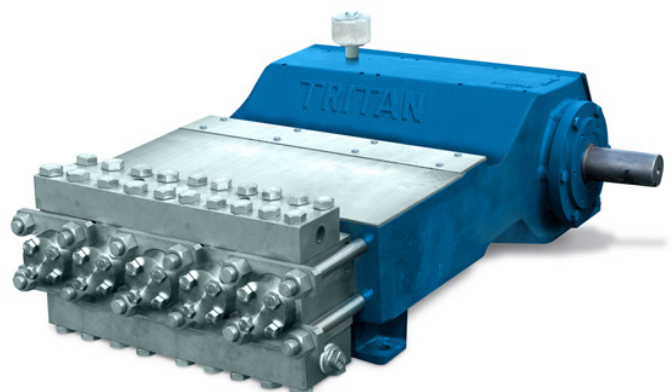
- Atlas Copco
- KTI – Korea



DTH Hammer Bits

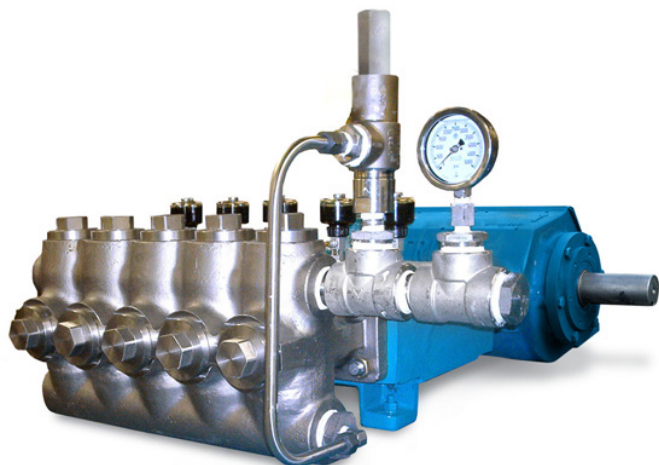


Drilling Fluids (Drilling Mud) As per API 13 A



API 674 Compliant Quintuplex Plunger Pump

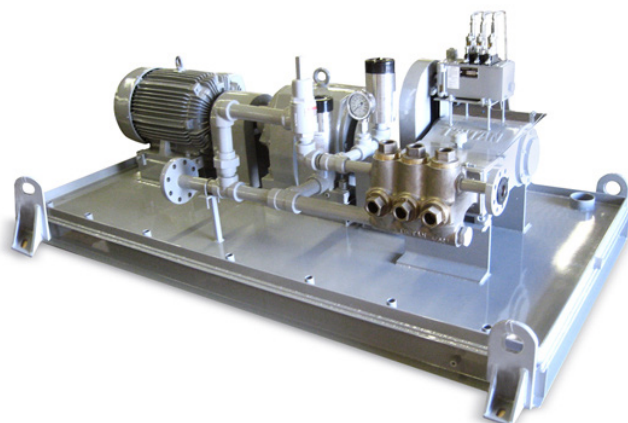
- Pressure up to 40,000 psi
- Flow up to 72 GPM



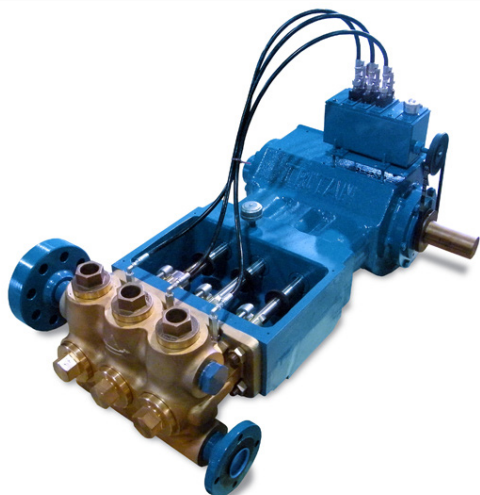
API 674 Compliant
Quintuplex Plunger Pump

- Pressure up to 5,250 ps
- Flow up to 344 GPM

TRIPLEX / QUINTUPLEX PUMP SETS



Electric Motor Driven



API 674 Compliant
Triplex Plunger Pump

- Pressure up to 5,250 psi
- Flow up to 207 GPM

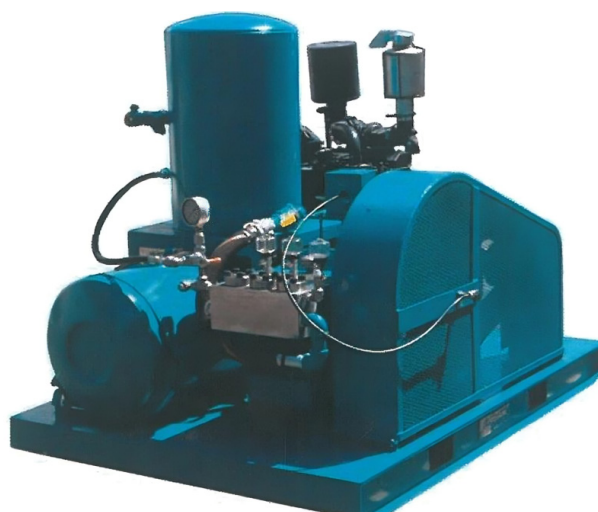


Diesel Engine Driven



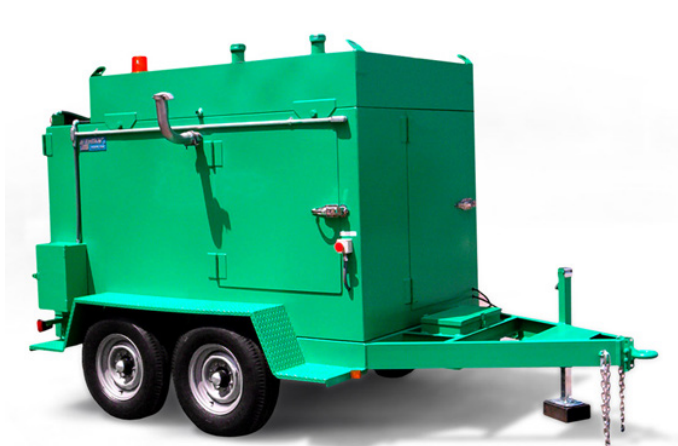
API 674 Compliant
Triplex Plunger Pump

- Pressure up to 40,000 psi
- Flow up to 24 GPM



Hydrostatic Pressure Tester

- Pressure up to 22,500 psi
- Flow rate 5 – 24 GPM



Mobile Diesel Engine driven
Plunger Pump Set



LV Cables 0.6/1KV



Amphibious Excavator



Blog-hv-power-cables-2



Transformer



Oil Transformer



**Arab Water & Energy
Technologies Co. LTD**

Contact Information

Website: www.awstco.com

Email: manager@awstco.com

Tel: +962 6 582 6392

+962 6 582 6393

Location:

Amman – Jordan

Baghdad - Iraq

“Water is Life, Use it wisely”

The image features a close-up, shallow depth-of-field shot of industrial water utility equipment. In the foreground, a vertical stainless steel pipe assembly is prominent, featuring a flange with a yellow triangular warning label that includes a curved arrow and the text '10cm' and '4"'. To the left, a blue cable is plugged into a component. The background shows more complex piping and valves, all in a clean, industrial setting. The Fortinet logo is overlaid in the top left corner.

FORTINET

Fortinet's Insights: Strengthening Cybersecurity in Water Utilities Amid Digital Transformation

Water utilities are shifting from isolated operational technology (OT) to integrated digital infrastructures that connect information technology (IT). This change enhances access to accurate and timely data, boosting efficiency and effectiveness. However, it also increases the risk of cyberattacks, drawing significant public and media attention. Incidents have revealed vulnerabilities, including unauthorized access to plant controls and ransomware attacks that disrupt operations and threaten customer data security. In response, federal agencies like the EPA and CISA are launching initiatives to improve cybersecurity in water utilities, highlighting the urgent need for increased awareness and proactive measures across the sector.



Current and Emerging Technologies in Water Utilities

Water utilities today demonstrate the greatest confidence in technologies that support regulatory compliance, operational monitoring, and control, with 83% of leaders prioritizing these areas. Systems related to utility billing, customer interaction, and asset management follow closely behind in terms of reliability. Confidence in meeting cybersecurity needs remains moderate at 49%, while tools focused on sustainability and resilience rank slightly lower. In contrast, confidence in adopting newer technologies such as data integration, revenue recovery, predictive analytics, digital transformation, and cloud computing is still limited. Nonetheless, as utilities move toward implementing these advanced solutions, cybersecurity will play an increasingly critical role in ensuring safe and effective digital transformation.



Cybersecurity Tops the List of Future Investments in Water Utilities

When asked about future technology priorities, utility leaders ranked cybersecurity as the highest area for investment. According to the survey, 26% of respondents plan to enhance cybersecurity measures within the next year, while another 22% expect to do so within two years. Following closely behind were planned investments in asset management, Geographic Information Systems (GIS), and automated metering infrastructure, highlighting the growing emphasis on both digital security and operational efficiency in the sector.

Cybersecurity Responsibilities, Concerns, and Preparedness in Water Utilities

- Unclear Responsibility for Cybersecurity

Cybersecurity responsibility is often poorly defined within water utilities. According to 40% of respondents, oversight lies with the Head of IT or the Chief Information Security Officer (CISO). However, 32% reported that “other” individuals such as city managers, operators, governing boards, mayors, town councils, or even finance and HR directors were assigned this role. In many cases, these designations reflect limited expertise and insufficient leadership capacity to respond effectively to cyber threats.

Given the critical nature of water infrastructure, it is essential that overall cybersecurity responsibilities be clearly defined and assigned to qualified professionals.

- Top Concerns: Public Health, Compliance, and Service Continuity

Water leaders ranked threats to public health and water quality as their most pressing cybersecurity concerns, with 79% marking them as extremely or very important. Nearly as critical were regulatory compliance (78%) and uninterrupted service delivery (77%).

- Malware and Ransomware Outweigh Other Threats

Respondents identified ransomware (37%) and malware or phishing attacks (25%) as their greatest concerns. Interestingly, these surpassed worries about insider threats and existing vulnerabilities, despite the fact that such vulnerabilities have been the source of some of the most publicized cyber incidents in the industry.

- Awareness Gaps and False Sense of Security

While 79% of respondents reported no cyber incidents in the past 12 months, experts caution that this may reflect a lack of awareness rather than genuine safety. Without proper intrusion detection systems, utilities may fail to notice breaches, leaving vulnerabilities exposed and attackers undetected.

- Preparedness Levels Remain Low

Survey results revealed that 41% of participants had only achieved a basic maturity level of access control. Meanwhile, 19% had established visibility and segmentation, 9% had implemented orchestration and automation, and another 19% had no visibility or segmentation at all. Most concerning, 43% of respondents did not know their preparedness level, suggesting many utilities have yet to conduct meaningful cybersecurity assessments.

- Underestimation of Cyber Threat Exposure

More than 62% of respondents believed their exposure to cyberattacks remained unchanged in the past year, while 26% acknowledged an increase and 12% believed it had decreased. Such perceptions may underestimate the actual risks. As digital connectivity expands, particularly following pandemic-driven remote operations, the likelihood of cyberattacks across operational technology environments has grown significantly.



Cybersecurity Strategy in the Water Sector

- Knowledge Gaps in Cybersecurity Strategy

When asked about the elements included in their organization's cybersecurity strategy, 54% of respondents identified implementing or improving identity and access management. Other measures were noted by only 37% to 40% of participants, while 27% to 40% admitted they did not know what their plan included. This highlights a critical knowledge gap and the urgent need for cybersecurity training and education among water utility leaders.

- Sources of Decision-Making

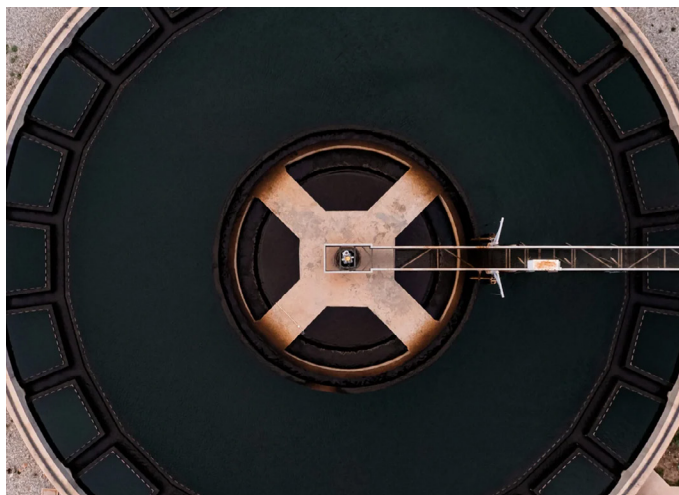
Survey results revealed that 31% of participants relied on industry consultants when making cybersecurity decisions, while 24% drew on best practices and case studies, and 21% collaborated with trusted partners. Another 18% conducted independent research through reports or analyst conversations, and a further 18% pointed to their long-term strategy. Notably, 14% indicated they had no long-term cybersecurity strategy at all. The fact that 25% did not know what sources guided their organization underscores the lack of structured decision-making and the pressing need for comprehensive training programs to foster a stronger cybersecurity culture.

- Focus Areas for the Next 12 Months

When asked about improvement priorities, respondents emphasized securing remote access (41%), enforcing identity and access management (31%), and securing wireless access (29%). Additional focus areas included threat intelligence (21%), endpoint security (19%), system patching (12%), network segmentation (12%), increasing network visibility (11%), and network traffic analysis (9%).

- Challenges to Cybersecurity Improvement

The most significant challenge reported was a poor understanding of what changes were required (35%). Limited funding (32%), lack of a clearly defined strategy (30%), and the heavy focus on day-to-day operations (29%) were also key barriers. These findings reflect insufficient cybersecurity education, limited financial resources, and a lack of prioritization across the sector.



- The Need for Greater Investment

Although 44% of respondents planned to invest in network and asset protection within the next two years, similar proportions cited incident detection (44%) and recovery (43%) as priorities. However, 18% to 26% had no plans to invest in cybersecurity, and 32% to 40% were uncertain about investment timelines. Given the rising risks, there is an urgent need for water utilities to prioritize cybersecurity readiness and establish proactive defense strategies.

Cybersecurity Self-Assessment Highlights Rising Awareness

Survey results indicate a significant shift in the water sector's approach to cybersecurity. Seventy-one percent of participants reported that their organizations and the industry overall are now far more concerned about cybersecurity than they were a year ago. An equal share (71%) emphasized that digital innovation is vital to achieving strategic security objectives, while 69% agreed their boards of directors recognize the importance of a strong cybersecurity program. With continued investment in education, training, and funding, water leaders can play a more active role in driving the necessary improvements to protect critical systems.

Conclusion

The transition of water utilities to digitally connected infrastructures presents both opportunities and challenges. Fortinet's survey reveals that while advanced technologies enhance operational efficiency and regulatory compliance, they also increase cybersecurity risks. With growing concerns about public health and potential cyberattacks, it is vital for water utilities to prioritize cybersecurity in their digital strategies. The findings highlight the need for clear responsibilities, increased investment in protective measures, and a proactive risk management approach to safeguard operations and ensure the resilience of essential services.

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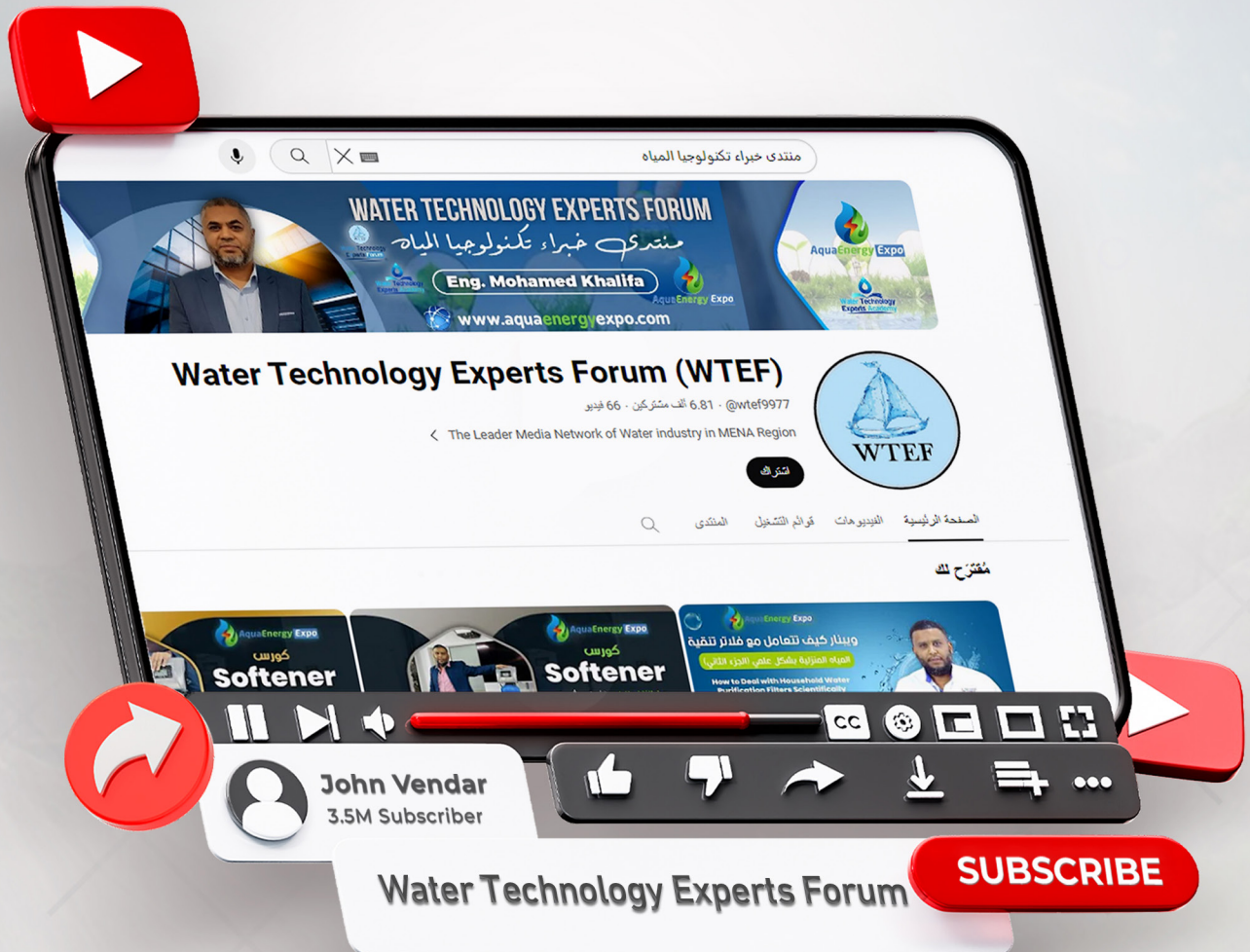
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Dr. Walaa Mohamed El-Srogy

Applications of Artificial Intelligence in the Water Sector:
From Traditional Operation To Smart Management.



Friday, November 7th



8:00-10:00 Pm
(Saudi Arabia Time)



Dr. Mohamed Haikal

An overview of desalination technologies
and criteria for selecting the appropriate
technology.



Saturday, November 8th



8:00 to 10:00 PM
(Saudi Arabia Time)



Dr. Ali Ahmed Maan

Interpretation of Water
Analysis Results



Saturday, November 15th



8:00-10:00Pm
(Saudi Arabia Time)



Dr. El-Sawy Mabrouk

From the Source to the Sample: Understanding
Industrial Wastewater



Friday, November 21st



8:00 to 10:00 PM
(Saudi Arabia Time)



Eng. Atef Abd El-Fattah & Dr. Mohannad Hesham Abou Elrouse

Artificial Intelligence in Water Treatment Plant Maintenance



Saturday, November 22nd



08:00 to 10:00 PM
(Saudi Arabia Time)



Chemist. Mona El-Shafey

The Role of Zooplankton in Freshwater: Impacts
and Treatment Challenges



Friday, November 28th



08:00 to 10:00 PM
(Saudi Arabia Time)



Eng. Mohammed Kastawy

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Lower Operating Costs with Filtralite®



Saturday, November 29th



08:00 to 10:00 PM
(Saudi Arabia Time)



Smart Pumps and AI: Driving the Future of Efficiency and Reliability



Smart pump technology has advanced significantly in recent years, lowering maintenance costs, enabling remote monitoring, and increasing energy efficiency. AI has the ability to improve this even more, assisting companies and governmental organizations in delivering optimal pump performance and efficiency while lowering the need for costly engineer callouts.

Smart Pumps: What Are They?

IoT sensors, automated controls, and real-time monitoring capabilities enable intelligent pumps to dynamically adjust to operating conditions. These pumps automatically optimize their flow rate, pressure, and energy consumption to ensure maximum efficiency, in contrast to traditional pumps that need manual adjustments or run at set speeds.

To give continuous feedback on system performance, these pumps make use of cloud-based analytics, embedded sensors, and variable frequency drives (VFDs). This eliminates the need for manual oversight by enabling operators to remotely monitor, diagnose, and even modify pump operation.

The Differences Between Conventional and High-Tech Pumps

Conventional industrial pumps are powered by fixed-speed motors or need to be manually adjusted on-site to adapt to changes in the process. Due to excessive wear, this frequently leads to overuse, inefficiency, and higher maintenance requirements.

IoT-enabled pumps, on the other hand, continuously assess system demand and make real-time performance adjustments. For instance:

- The pump automatically adapts to higher flow requirements if demand rises.
- The pump uses less energy when demand declines because it slows down.
- The system notifies operators in advance of significant failures if a problem is identified, such as low suction pressure or cavitation.

Smart pumps' ascent

The smart pump market is experiencing significant growth, projected to achieve a compound annual growth rate (CAGR) of 8.5% from 2023 to 2028, potentially reaching £72.7 billion by 2029. Facilities managers face rising costs

and challenges from pump outages, exacerbated by complex supply chains and global instability. To mitigate the risk of downtime, companies are increasingly monitoring pump health to detect issues early.

Advancements in technology enable a better understanding of pump systems, enhancing performance and energy efficiency while reducing costly repairs. Remote monitoring allows managers to track critical indicators like water flow rates and power status, while sophisticated smart pumps provide detailed data on temperature, chlorine levels, and water quality. These innovations are optimizing cooling systems, preventing wastewater blockages, and ensuring consistent water pressure, thus transforming utility delivery in large facilities such as hospitals, universities, and correctional institutions.

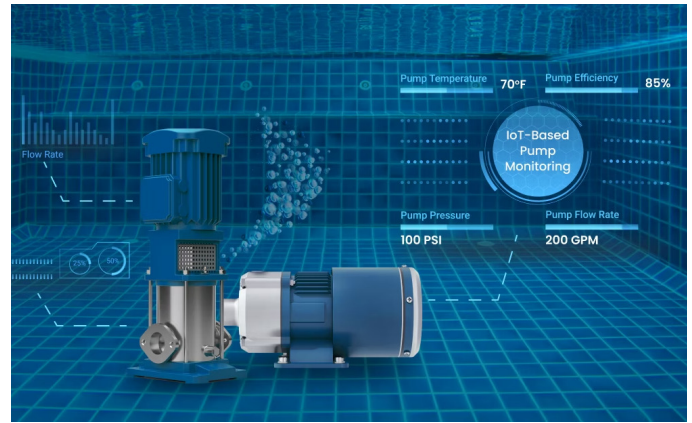


Important Advantages of IoT-Enabled Pumps

Among the many benefits of smart pump systems are lower downtime and higher energy efficiency.

- Enhanced Efficiency in Energy Use

Conventional pumps waste a lot of energy because they run constantly, even when demand changes. Conversely, smart process control pumps use variable frequency drives (VFDs) to dynamically modify motor speeds in order to maximize performance. These systems drastically cut operating costs by up to 50%.



- Predictive Maintenance and Reduced Downtime

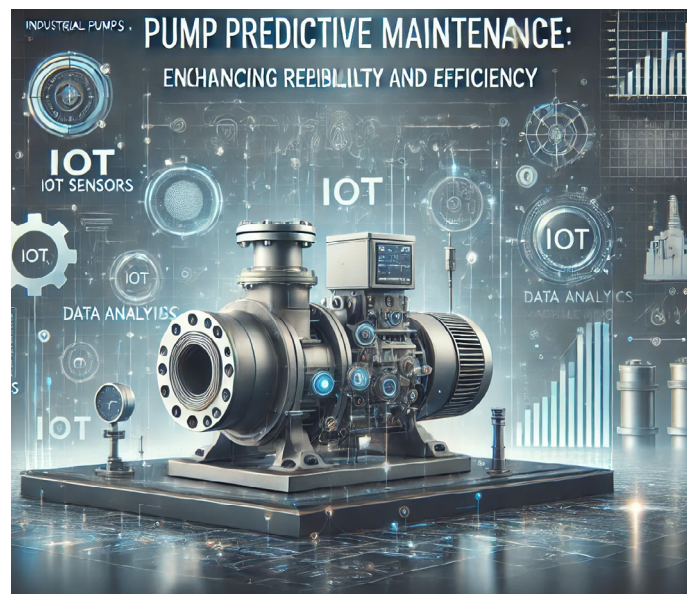
One of the biggest advantages of IoT in pumping systems is its ability to detect maintenance issues before they cause failure.

- Monitor vibration levels, temperature, pressure, and flow rates to detect early signs of wear.
- Use predictive analytics to forecast potential breakdowns, allowing for proactive maintenance instead of reactive repairs.
- Reduce unplanned downtime, preventing costly interruptions to production.

- Remote Monitoring and Control

IoT-driven pumps provide 24/7 remote access to system performance data. Through cloud-based platforms, operators can:

- Track system performance in real-time and receive alerts for potential issues.
- Adjust settings remotely, optimizing pump performance without requiring physical inspections.
- Monitor energy consumption, ensuring compliance with sustainability goals.



Applications in the Real World

- Water Distribution and Treatment

Automated pumps are essential for precisely controlling dosing and distribution rates in municipal and industrial water treatment facilities. IoT-enabled water pumps minimize wasteful energy use while preserving ideal water quality by adapting to demand in real time.

Smart pumps with chemical dosing technology are used in many water treatment applications to automatically control disinfectant concentrations and pH levels, guaranteeing adherence to water safety regulations.



- Building and HVAC Systems

By dynamically modifying circulation flow in response to building occupancy and seasonal temperature fluctuations, smart pumps increase the energy efficiency of HVAC and cooling systems.

- Applications of Industrial Processes

Precision fluid handling is necessary in sectors like food manufacturing, pharmaceuticals, and chemical processing to guarantee product safety and consistency.

- Accurate chemical dosing reduces waste thanks to smart pumps.
- Maintain process stability by avoiding pressure variations and surges.
- Longevity of equipment through automated flow rate modifications.

The Possible Argument for Applying AI

The adoption of smart pumps is being significantly propelled by advancements in sensory technology, decreasing costs of connected

hardware, and sophisticated predictive analytics. These factors enhance the accessibility of real-time monitoring, enabling more companies worldwide to utilize detailed reports and analytics for their pump systems. Smart pumps present a compelling business case; they consume less energy, require reduced maintenance, and ensure greater compliance. The integration of AI and machine learning is expected to amplify these benefits. For instance, by monitoring feed temperatures from water tanks, smart pumps can detect issues such as blocked valves or motor problems and even assess legionella risks.

Adjustments based on return water temperature monitoring have led to energy savings exceeding 50% in some cases. The incorporation of AI can optimize not just pumps, but also boilers, valves, and the entire distribution network. As more smart pumps are integrated, the additional data will enhance AI models, revealing trends that human analysis might miss. This presents an unprecedented opportunity to revolutionize water management and the pump industry. With growing pressures related to budgets, sustainability, and compliance, the efficiency and maintenance advantages of smart pump technology are increasingly crucial and readily available for adoption.



IoT's Potential in Pumping Systems

The efficiency and automation of industrial pumping systems will increase further as IoT technology develops. Future advancements will include:

- AI-driven smart pumps that use machine learning algorithms to self-optimize performance.
- Through automated reporting and efficiency tracking, smart sustainability solutions enable

businesses to monitor and lower their carbon footprints.

- Cloud-based pump monitoring platforms facilitate smooth integration with other industrial systems.

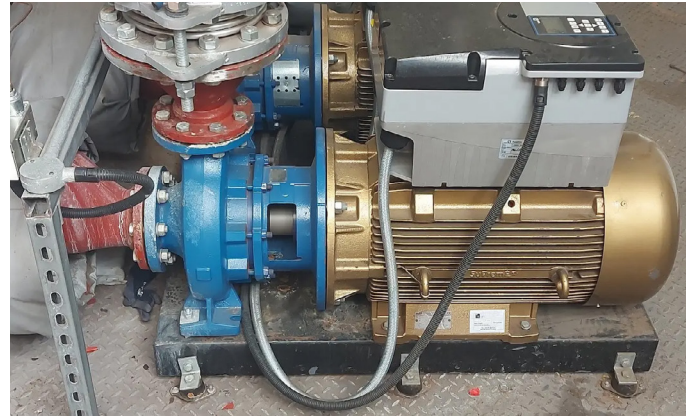
Optimal Performance

The way that industries handle fluid transfer, energy use, and maintenance tasks has been completely transformed by the incorporation of IoT into pumping systems. Smart pumps provide real-time insights for better decision-making while increasing efficiency, reliability, and cost reduction.

Case Study: Dura Pumps Delivers 40% Energy Savings at Warwickshire Hospital

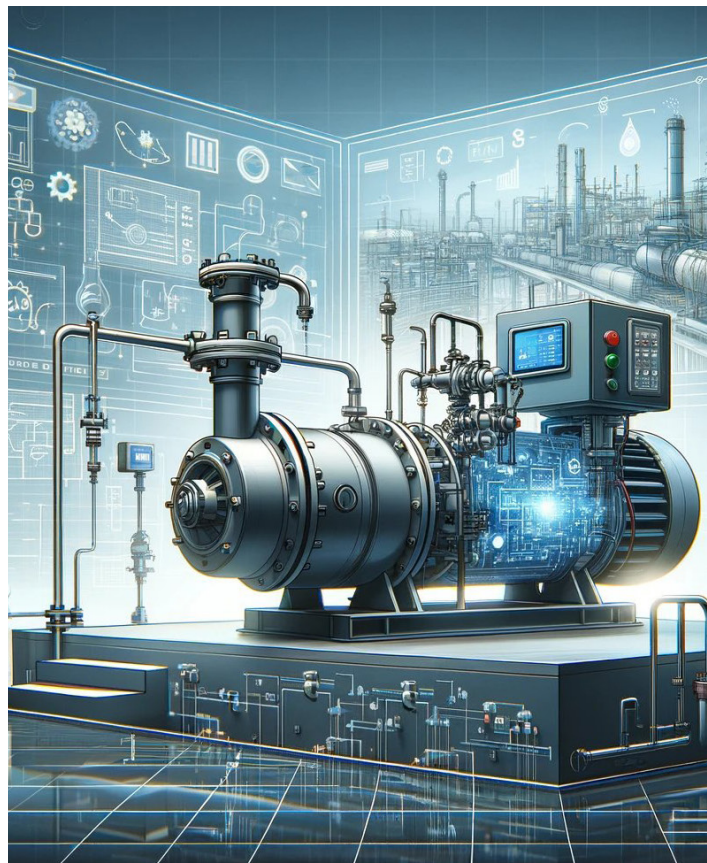


Every eight to twelve months, the main Low Temperature Hot Water (LTHW) circulation pumps at a sizable hospital in Warwickshire would frequently fail. The current pumps had to run constantly at full speed due to improper specification, which caused them



to cavitate and fail too soon. Compared to the proper specification, this led to an additional £3,153 in monthly operating expenses.

Installing new, appropriately sized pumps (Lowara NSCS 150-250) from Dura Pumps Co. and variable speed inverters (Danfoss FC102) was the solution. As a result, the pumps can adjust their operation according to real demand. The results were noteworthy: a substantial cost reduction with an impressive 17-month payback period, an estimated lifespan extension to 5-10 years between overhauls, and 40% energy savings (reducing annual consumption by \$94,608 kWh). In addition to improving patient comfort, this upgrade increased the hospital's sustainability, efficiency, and dependability.



Conclusion

The way that businesses and government organizations handle energy, maintenance, and system dependability has completely changed as a result of smart pumps. These systems already provide significant increases in operational resilience, cost savings, and efficiency by fusing IoT sensors, predictive analytics, and remote monitoring. Deeper energy savings and more intelligent predictive maintenance will be possible as AI and machine learning capabilities advance and the potential for optimization across entire building and industrial networks only increases. Adopting smart pump technology is now a strategic investment that promotes performance, resilience, and long-term value as budgets get tighter and sustainability objectives become more urgent.



Thermodiffusive Desalination: A Sustainable Approach to Freshwater Shortages

Desalination is emerging as a crucial technology to combat the escalating global freshwater shortages driven by climate change and population growth. Traditional methods, while effective, often require significant energy and resources. Innovative approaches, such as thermodiffusive desalination, are being developed to provide more sustainable and efficient solutions for accessing fresh water from seawater.

Desalination concepts

Desalination may hold the key to resolving the global freshwater shortage dilemma, which is being made worse by climate change. Many desalination concepts have been put forth, and they can be divided into two groups:

- **Phase-change-based thermal desalination techniques:**

like freeze desalination and multistage flash distillation, are typically linked to significant energy usage.

Due to their comparatively low energy consumption, which is closer to the theoretical minimum energy of desalination.

- **Functional-materials-based desalination techniques:**

such reverse osmosis (RO), are the industry standard. RO has the largest installed capacity, accounting for about 74% of the world's desalination output, and continues to draw the most investment in R&D.



Revolutionizing Desalination with Solar Energy

Researchers at the Australian National University have developed a new approach for desalinating water that does not use electricity.

The method uses solar energy and can be deployed in remote locations, even in low-income countries. With freshwater shortages seen in multiple parts of the globe, countries are turning to seawater and desalinating it to meet their water demands.

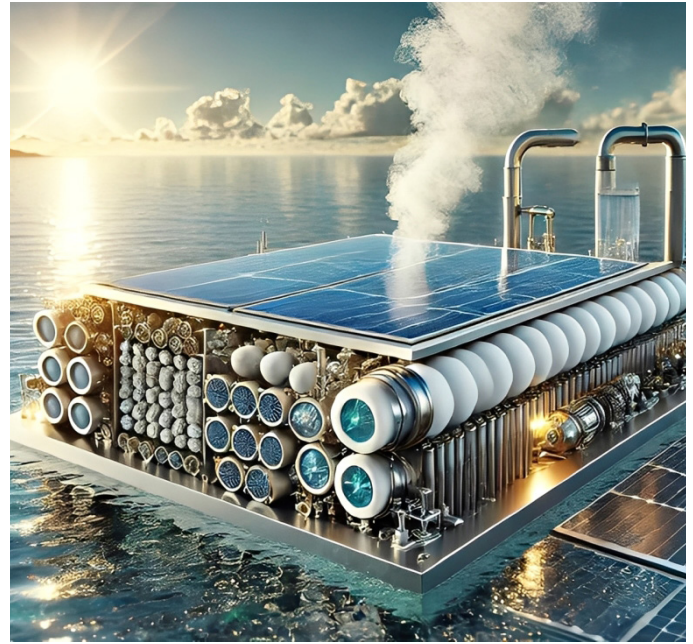
The World Bank estimates that as many as 300 million people in 150 countries depend on desalination for their water needs. A research team led by Juan Felipe Torres, a professor at the School of Engineering at ANU, has turned to solar energy to reduce energy consumption by as much as 80 percent.



Low-grade heat for desalination

Researchers have utilized thermodiffusion, a temperature gradient, to move salt from the warmer side to the colder side for desalination. This process involves a narrow channel for seawater sandwiched between two plates maintained at different temperatures. The water with low salinity rises from the top, while water with high salinity rises from the bottom. After removing the colder, saltier water, the water's salini-

ty drops by 3% with each pass, dropping from 30,000 parts per million to less than 500 ppm. The heat required for the process may originate from industrial waste heat or sunshine.



Solving desalination problems

Up to 100 kWh of electricity can be used for each cubic meter of clean water produced by conventional desalination techniques. Costly materials, like membranes that require a lot of care and are prone to corrosion, are needed for this energy-intensive process. Because of this, desalination is now a costly method that is challenging to implement in rural or low-income nations.

“Thermodiffusive desalination is the first thermal desalination method that does not require a phase change,” said Torres in a press release. “It’s operated entirely in the liquid phase, and what’s more important is that it does not require membranes or other types of ion-adsorbing materials to purify water.”

Thermodiffusive desalination is perfect for large-scale implementation because it doesn’t require membranes. For usage on the island of Tonga, which is experiencing a severe drought, the researchers are currently constructing a multichannel device. The device will be powered by a solar panel, no bigger than a human face.

“Our dream is to enable a paradigm shift in desalination technology, based on methods that can be driven by low-temperature heat in our surrounding environment”



Energy Challenges in Desalination

Desalination requires a lot of energy, though. It was responsible for 100 billion kilowatts of electricity use in 2018, which is equivalent to one-fourth of the energy used for water provisioning. This is explained by methods like reverse osmosis, which separates water using high pressure, or evaporating water using heat.

However, many developing locations lack infrastructure, qualified workers, and energy resources, making RO unfeasible. It requires costly material maintenance and a huge electric power supply (electric power consumption per unit volume of yield $>3 \text{ kWh m}^{-3}$).

Thermodiffusive Desalination Advantages

Recently, thermodiffusive desalination (TDD) was proposed, which is a method with many desirable characteristics

Liquid-phase thermal desalination

TDD is the only all-liquid thermal desalination technique that we are aware of.

At moderate temperatures (30–70 °C), heat can drive it without causing a phase shift. On the other hand, conventional evaporation-based thermal processes use a lot of energy, damage

materials, and create solid salts that are difficult to remove. Compared to multiphase approaches, TDD is theoretically simpler to apply and industrialize

Membraneless process

Unlike RO or other functional materials like ion adsorbents or porous foams, TDD does not rely on membranes to lower the salinity of water. TDD is therefore immune to the inherent performance deterioration linked to materials-based approaches, indicating a reliable technology with cheaper startup and maintenance expenses.

Greater separation with brine

Thermodiffusive separation is appropriate for treating brine since it scales approximately linearly with feedwater concentration. We suggest using thermodiffusive salination (TDS) to concentrate brine and thermodiffusion as a pre-treatment technique for RO when utilized to desalinate brine. In addition to enhancing the recovery rate of proven desalination methods and reducing the amount of brine released into the ocean, TDS could pave the path for zero liquid discharge (ZLD) and lessen its negative environmental effects.

Conclusion

Thermodiffusive desalination (TDD) represents a significant advancement in sustainable freshwater solutions. This innovative method utilizes a liquid-phase thermal process that operates without membranes or phase changes, leading to a substantial reduction in energy consumption and operational costs compared to traditional techniques. TDD's ability to harness low-grade heat from renewable sources, such as solar energy, makes it particularly suitable for remote and low-income regions. As global freshwater shortages worsen due to climate change, ongoing research in TDD could revolutionize desalination practices and enhance environmental sustainability, contributing to a more secure and accessible water future for all. And advancements, TDD could play a key role in achieving a more secure and accessible water future for all.



Transforming Wastewater: Europe's Largest BEWISE Research Facility Targets Net Zero Future

Europe's largest pilot-scale research facility focusing on Net-Zero wastewater treatment is called BEWISE (Biological Engineering: Wastewater Innovation at Scale), based at Newcastle University's and Northumbrian Water's Birtley sewage treatment plant. The facility allows for large-scale, real-world testing of innovative, low-carbon, and energy-efficient wastewater treatment technologies, such as those using bacteria and other microbes, to accelerate the transition to a net-zero future for the water sector.

BEWISE Facility: Europe's Largest Wastewater Research Plant with Quadrillions of Microbes

The BEWISE facility uses actual wastewater received from more than 30,000 people.

It combines multiple wastewater treatment units – in a sense, it is many labs in one. The £1.2 million EPSRC-funded BEWISE plant is the largest facility of its type in Europe. Newcastle University and Northumbrian Water have contributed a further £0.5 million to its value. BEWISE operates with 10¹⁵ microbes: a quadrillion microbes, or one million billions. This is 10,000 times more than can be used in the laboratory.

Research Using Bacteria

Newcastle University's new Biological Engineering: Wastewater Innovation at Scale (BEWISE) research facility is the largest of its type in Europe. The new facility - based at Northumbrian Water's sewage treatment plant at Birtley, near Gateshead - will play a key role in improving

how sewage is treated, by speeding up the transition from existing energy-intensive treatment processes to low carbon alternatives that have lower running costs.

BE:WISE: Transforming Wastewater Treatment Through Large-Scale Research

Sewage treatment plants contain a varied assortment of trillions of bacteria that break down and treat wastewater. However, the costs and uncertainty involved in scaling up lab research to application in a real-world setting has meant that there has been little change in the main technologies used to manage the wastewater treatment process.

Operating as a 'mini' sewage treatment works, the BE:WISE facility will allow experiments to be run using 10,000 times more microbes than can be used in the laboratory, providing researchers with a realistic, large-scale setting to better understand how complex biological interactions work at different scales. It will allow them to test and replicate different elements of the wastewater treatment process, so that new ways to treat wastewater can be developed with greater confidence.

Dr Russell Davenport, from Newcastle University's School of Civil Engineering and Geosciences who will lead the work carried out at the new facility, explained:

“The water industry faces unprecedented global challenges such as population growth and climate change while having to meet increasingly stringent environmental regulations. But wastewater treatment uses pretty much the same energy-intensive technology now as was being used decades ago.”

Innovation through partnership

Northumbrian Water is providing the space where BE:WISE is located, along with key infrastructure support. The first experiments - to identify the behaviour of thousands of species of bacteria - will get underway immediately, using wastewater from the Birtley sewage treatment plant, which receives wastewater from a population equivalent of around 30,000 people.



This wastewater will only have been through primary treatment which removes solids, rags and grit. Heidi Mottram, Northumbrian Water's CEO, said:

“This internationally significant facility demonstrates Northumbrian Water's environmental leadership. It shows how essential partnership working is to enable innovation in advancing technology. It is fantastic that academia and industry have come together to improve sustainable wastewater treatment, which is a vital part of our everyday lives and plays an essential role in protecting our precious environment.”



New global standard

Professor Nick Wright, Pro-Vice-Chancellor for Research and Innovation, Newcastle University, added:

“Sustainable and affordable wastewater treatment requires new technology and new thinking, but many potential solutions never make it past the lab due to the cost and uncertainty involved in working at a larger scale. BE:WISE will set a new global standard for research into wastewater treatment technologies and processes and place Newcastle University, and the UK, as a centre of excellence in wastewater management.”

The new facility is linked to another research project at Newcastle University called Frontiers in Engineering Biology (NUFEB) which aims to develop computer simulations of wastewater plants based on a new understanding of the rules that determine the dynamics of complex biological communities. This would speed up innovation of new systems using natural or synthetic organisms.



Key Facts

- The £1.2 million EPSRC-funded BE:WISE plant is the largest facility of its type in Europe. Newcastle University and Northumbrian Water have contributed a further £0.5 million to its value.
- BE: WISE operates with 10¹⁵ microbes: a quadrillion microbes, or one million billions. This is 10,000 times more than can be used in the laboratory.
- Scientists will use BE:WISE to run experiments exploring different types and combinations of bacteria to identify how they behave in different sewage treatment processes.

- Northumbrian Water has 413 sewage treatment works across the North East region which treat around 800 million litres of wastewater every day. Birtley sewage treatment works treats up to 10,000 million litres of wastewater a day.
- The BE:WISE facility will also have two novel treatment systems that capture energy from the wastewater.
- Standard sewage treatment accounts for up to 1.5% of UK electricity usage, much of it for aeration. The water industry generates 4 million tonnes of CO₂ per annum - 0.7% of UK greenhouse gas emissions.
- Over £100 billion has been invested in standard sewage treatment processes since 1998. The very long design lives (25 – 50 years) of existing technologies mean it will take at least a generation (2030 and beyond) for their replacement, whereas the biology may be changed on shorter timescales.
- The UK water industry is expected to spend £28 billion in energy-intensive wastewater treatment technologies to meet new environmental standards.

Conclusion

Newcastle University's BEWISE (Biological Engineering: Wastewater Innovation at Scale) facility, located at Northumbrian Water's Birtley sewage treatment plant, is Europe's largest pilot-scale research plant for wastewater treatment. Funded by £1.2 million from EPSRC and an additional £0.5 million from Newcastle University and Northumbrian Water, BEWISE enables large-scale, real-world testing of low-carbon, energy-efficient technologies. It operates with quadrillions of microbes (10,000 times more than in labs) to study complex biological interactions and develop sustainable wastewater treatment methods. The facility addresses global challenges like population growth, climate change, and stringent environmental regulations, aiming to replace outdated, energy-intensive technologies with innovative solutions. BEWISE sets a new global standard for wastewater research, positioning the UK as a leader in this field.

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ADNOC, Masdar, XRG and Microsoft to Advance AI for Energy and Energy for AI

ADNOC, Masdar, XRG, and Microsoft have formed a strategic partnership to enhance AI adoption across ADNOC's operations and support Microsoft's global energy requirements for AI and data centers. Announced at the ENACT Majlis in Abu Dhabi, the collaboration aims to develop AI agents that improve efficiency and digital capabilities throughout ADNOC's value chain. Additionally, the companies will work together to create clean energy infrastructure. His Excellency Dr. Sultan Ahmed Al Jaber highlighted the UAE's commitment to integrating AI in industry, positioning Abu Dhabi as a global hub for energy innovation and sustainable solutions in the AI-driven future.



Iberdrola distributed 188,753 GWh of electricity until September, up 6%, driven by the United Kingdom and Spain



Iberdrola's electricity distribution increased by 6% to 188,753 GWh in the first nine months of 2025, largely due to a 43% rise in the UK and a 3% increase in Spain. Production also rose to 96,047 GWh, driven by significant growth in offshore wind (33%) and solar energy (41%). The company's installed capacity reached 57,453 MW, while emissions decreased to 57 grams of CO₂ per kWh. Notably, 86% of its production came from clean energy sources, highlighting Iberdrola's commitment to sustainable energy solutions and reduced environmental impact.

LONGi Partners with Indonesia to Advance Renewable Energy Goals at ISF 2025

LONGi reaffirmed its commitment to Indonesia's clean energy transition at the Indonesia International Sustainability Forum (ISF) 2025. During the "Unleashing Green Electricity" session, Haimeng Zhang, Vice President and Chief Sustainability Officer, outlined a strategy based on three pillars: advanced solar technology, local value creation, and global expertise. Zhang emphasized LONGi's dedication to supporting Indonesia's renewable energy ambitions through sustainable partnerships and innovative solar solutions. This approach aligns with Indonesia's vision for clean energy development, highlighting LONGi's role in fostering a sustainable future and contributing to the country's energy landscape transformation.



TotalEnergies Sells its GreenFlex Affiliate to the French Group Oteis to Create a Leading Player in Sustainable Consultancy and Solutions

TotalEnergies has announced the sale of its sustainable consultancy subsidiary, GreenFlex, to Oteis, a French consulting and engineering firm. This decision aligns with TotalEnergies' strategy to concentrate on its core energy production and supply operations. Oteis intends to utilize GreenFlex's sustainability expertise to strengthen its environmental services platform. Following the sale, TotalEnergies will continue as a significant customer through a contract for French Energy Saving Certificates (CEEs). The transaction is subject to regulatory approvals and employee consultations, marking a strategic shift for both companies in the sustainability sector.



Sungrow Exceeds 50GW of PV Inverter Shipments in India



Sungrow, a prominent global provider of PV inverters and energy storage systems, has successfully shipped 50 GW of inverters in India, reinforcing its leadership in the solar industry. Since entering the Indian market in 2014, Sungrow has established a strong reputation for reliability. Sunil Badesra, Country Manager of Sungrow India, remarked that reaching 50 GW is not just a milestone but a launchpad for the company's next chapter. He emphasized Sungrow's commitment to sustainability and fostering local partnerships as it continues to expand its influence in the renewable energy sector.

Voltalia begins commissioning of French Guiana biomass plant

Voltalia has commenced the commissioning of its 10.5-megawatt biomass power plant in Sinnamary, French Guiana, complementing its existing facilities in Kourou and Cacao. The initial boiler ignitions took place in April 2025, marking the beginning of technical testing. Once fully operational, the plant is expected to supply up to 8% of the region's electricity needs, effectively doubling Voltalia's local generation capacity to approximately 16%. This development aims to enhance energy autonomy and resilience in French Guiana, contributing to a more sustainable energy landscape for the region.



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