内部资料

2025年第1期（总7期）

AQUATECH

水技术

CONTENTS

目录

净水装置
Point of Use
Point of Entry

水环境治理
Water Environment Treatment

饮用水
Drinking Water

水的再利用
Water Reuse

水处理
Water Treatment

市政用水
Utility Water

污泥处理
Sludge Treatment

数字水务
Digital Water

管道
Pipes

给排水管网
Water Network

生物资源
Bio Resource

膜
Membranes

智能计量
Smart Meters

工业用水
Industrial Water

超纯水
Ultra-pure Water

脱盐
Desalination

紫外线处理
Ultraviolet Treatment

农村污水
Rural Wastewater

水资源管理
Water Resource Management

Aquatech was founded in 1968. As a long-established trade fair with a 100% focus on water, Aquatech Amsterdam is a unique event in Europe with a visitor attendance of 22,000+ and over 800+ exhibitors every other year.

Aquatech品牌创立于1968年。作为水处理行业历史悠久的展览会，荷兰国际水处理展览会（Aquatech Amsterdam）至今已有近55年的举办历史。展会每两年举办一次，吸引超过800家企业参展与22,000人次的观众参观。

As the global demand for water products, technologies, and solutions rises, the water treatment industry presents immense opportunities for development. With its involvement in utility, industrial, agricultural, and service sectors, this industry plays a pivotal role in achieving environmental goals. Moreover, the continuous advancement and innovation of water treatment technology opens new avenues for progress.

随着水资源的日益紧张、国内环保要求的提高以及工业与民用净水的巨大需求，水处理相关高质量产品、技术、服务的需求量不断增加，水处理行业正迎来巨大的发展机遇。同时在"双碳"政策的背景下，水处理行业作为实现绿色低碳目标与推动行业创新发展的关键领域，其应用涉及市政、工业、农业、服务业等各行各业，总体市场份额将快速增长，水处理技术也必须与时俱进。

COULD A SAAS APP STORE BE THE FUTURE FOR SEWER MONITORING?
SAAS应用商店会是污水监测的未来吗?

German water-solutions provider Pluvion has secured €1 million pre-seed financing that will help it build toward a more resilient future, both for the company and the wider sector.
德国水解决方案提供商 Pluvion 获得了 100 万欧元的种子前融资，这将帮助该公司及更广泛的行业构建一个更具韧性的未来。

AI water management for all
面向所有人的AI水管理

The company is developing AI software solutions for water management that are designed to be affordable and accessible by everyone in the industry.
该公司正在开发旨在让行业内每个人都能负担得起和可获得的水管理 AI 软件解决方案。

CEO Phillip Grimm told Aquatech Online that he sees an app-store style future for water management solutions, where: "Every licensed partner can select the desired products from this store and integrate them into their ecosystem."
首席执行官 Phillip Grimm 在接受 Aquatech Online 采访时表示，他看到了水管理解决方案的应用商店式未来："每个授权合作伙伴都可以从这个商店中选择所需的产品，并将其集成到他们的生态系统中。"

His vision, he added, was to: "Empower our partners and enable them to sustainably improve the water industry. Our vision is a resilient water industry with zero emissions. There is still a lot to do until then."
他补充道，他的愿景是："赋能我们的合作伙伴，使他们能够可持续地改善水行业。我们的愿景是建立一个零排放的韧性水行业，但在那之前还有很多工作要做。"

Locating leaks without flow measurement data
在没有流量测量数据的情况下定位泄漏

The company's first solution is called Water+ which uses data-driven intelligent machine learning algorithms to monitor and detect water infiltration into sewer networks caused by events such as flooding and heavy rain. Water+ can use its learnings based on water level measurements to predict 'extraneous' water events and to alert users to critical areas.
该公司的第一个解决方案名为 Water+，它使用数据驱动的智能机器学习算法来监测和检测因洪水和大雨等事件导致的水渗入污水网络。Water+ 可以根据水位测量的学习来预测“外来”水事件，并向用户警报关键区域。

Grimm added: "WATER+ is the first data-driven solution that works without flow measurement data and instead learns the system behaviour with intelligent machine learning algorithms. This makes us cheaper and faster than the competition."
Grimm 补充道：“WATER+ 是第一个不依赖流量测量数据而工作的数据驱动解决方案，它是通过智能机器学习算法学习系统行为，这使我们比竞争对手更便宜、更快速。”

The solution can be used with a customer's GIS data and level measurements in optimally selected manholes. This allows the solution to be fully integrated into a customer's existing operations.
该解决方案可以与客户的 GIS 数据和在最佳选择的井盖中的水位测量一起使用，这使得该解决方案可以完全融入客户现有的运营中。

The company claims a cost-saving benefit of 10 times compared to more traditional methods of sewer monitoring and detection.
该公司声称，与更传统的污水监测和检测方法相比，这种方法节省了 10 倍的成本。

Funding and future developments
融资与未来发展

The pre-seed funding is the first step in the company's drive to accelerate the development and scaling of its AI-driven software solutions for the water management industry.
这笔种子前融资是该公司加速开发和扩展其 AI 驱动软件解决方案以服务于水管理行业的第一步。

Grimm explained: "We can make some key hires in the area of product development and key account management. This will enable us to make our WATER+ product accessible to an even larger target group and open up new markets."
Grimm 解释道：“我们可以在产品开发和关键客户管理领域进行一些关键招聘，这将使我们的 WATER+ 产品能够接触到更大的目标群体，并开辟新的市场。”

Making products that can be fully integrated with a customer's own solutions, scalable, affordable and downloadable from an 'app store', could help toward a more resilient sector. However, the company wants to continue its innovations, as such, the next stage of development for Water+ will "quantify damage sums (operating and emission costs) and determine the condition of the sewer system in order to prioritize remediation measures".
开发可以与客户自身解决方案完全集成、可扩展、可负担并可从“应用商店”下载的产品，可能有助于建立一个更具韧性的行业。然而，该公司希望继续进行创新，因此 Water+ 的下一阶段开发将“量化损害金额（运营和排放成本）并确定污水系统的状况，以优先考虑修复措施”。

"In addition, we will provide our B2B customers with an interactive portal to determine the optimum sensor placement for WATER+. This increases interaction with the end user, provides transparency and shortens the sales cycle."
"此外，我们将为 B2B 客户提供一个互动门户，以确定 WATER+ 的最佳传感器放置位置。这增加了与最终用户的互动，提供了透明度并缩短了销售周期。"

Investors and future funding rounds
投资者与未来融资轮

The pre-seeding funding round was led by AI investor D11Z, with other investors including the Start-up BW Seed Fund, managed by MBG Mittelständische Beteiligungsgesellschaft Baden-Württemberg, and kopa Ventures.
此次种子前融资轮由 AI 投资者 D11Z 主导，其他投资者包括由 MBG 中小企业投资公司管理的初创企业 BW 种子基金和 kopa 创投。

It is the latest success story for company's developing AI-based products for sewer monitoring and detection.
这是该公司开发基于 AI 的污水监测和检测产品的最新成功故事。

When the funding was announced to the media, Jan Ludwig, investment manager at D11Z Ventures, said: "Software solutions such as WATER+ can significantly improve the performance of wastewater systems through data-based analysis and automation, leading to better environmental results and economic benefits in the long term."
当融资消息向媒体公布时，D11Z 风投的投资经理 Jan Ludwig 表示："像 WATER+ 这样的软件解决方案可以通过基于数据的分析和自动化显著改善污水系统的性能，从长远来看，可以带来更好的环境效果和经济效益。"

He added: "As an investor, we are convinced that the water industry will benefit greatly from digitalization. Pluvion makes an essential contribution to the digital transformation and the responsible use of water."
他补充道："作为投资者，我们坚信水行业将从数字化中受益匪浅，而 Pluvion 为数字转型和水的负责任使用做出了重要贡献。"

The next funding round will start in 2025.
下一轮融资将于 2025 年开始。

AQUA TECHNOLOGY

CIRCULAR SOLUTIONS FOR WATER TREATMENT SLUDGE
水处理污泥：循环经济中的隐藏宝藏

A literature review carried out jointly by Dutch research and solutions provider Allied Waters and the UK-based Isle Utilities will support the development of circular solutions for water treatment sludges.
荷兰研究与解决方案提供商 Allied Waters 与英国的 Isle Utilities 联合写作的文献综述将支持水处理污泥循环解决方案的发展。

Why the need to find circular solutions for sludge
为什么需要寻找污泥的循环解决方案

The research focused on UK waste treatment, although the findings will help to inform practices elsewhere in Europe and the wider world. Currently, outlets for water treatment sludge in the UK include land spreading, discharge to sewers, capping (for landfills), or to landfill.
这项研究重点关注英国的废物处理，但其研究结果也将有助于指导欧洲其他地区及更广泛世界的实践。目前，英国水处理污泥的处理方式包括土地施用、排放到污水管道、封顶（用于垃圾填埋场）或直接填埋。

The work carried out by Allied Waters and Isle Utilities fed into a report published by UK Water Industry Research, titled Circular Economy – water treatment sludges. This looked at key questions around the use and value of bioresources recoverable from water treatment sludge, including:
Allied Waters 和 Isle Utilities 进行的工作为英国水行业研究发布的报告《循环经济——水处理污泥》提供了支持。该报告探讨了水处理污泥中可回收生物资源的使用和价值的关键问题，包括：

- Current and potential outlets and uses for water treatment sludges.
- 水处理污泥的当前和潜在处理方式及用途。

• Technologies available and emerging for reuse and recovery.
• 可用于再利用和回收的现有和新兴技术。

• Economic analysis evaluating the most appropriate option for the UK and Ireland water industry.
• 经济分析评估最适合英国和爱尔兰水工业的选择。

The research makes clear that the circular economy and advancements in technology development present an 'opportunity for water utilities to consider the value of the wastes they produce, and the resources they could potentially recover'.
研究明确表明，循环经济和技术发展的进步为水务公司提供了“可以考虑他们生产的废物价值和潜在回收资源的机会”。

Population growth is leading many countries to explore ways of extracting more resources from waste, including from potable water treatment sludge, which has both reuse and recovery potential.
人口增长促使许多国家探索从废物中提取更多资源的方法，包括从具有再利用和回收潜力的饮用水处理污泥中提取更多资源。

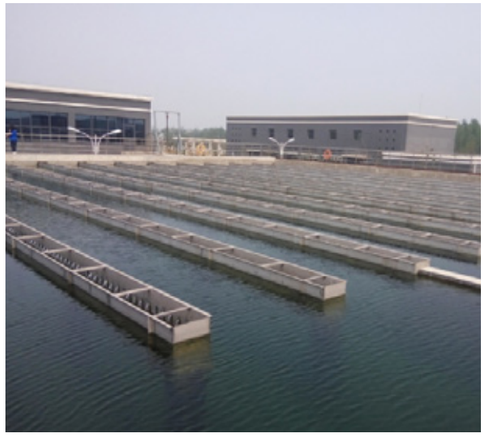
Resource recovery might include metal salts and nutrients that could provide reusable commodities.
污泥资源回收可能包括金属盐和营养物质，这些可以加工成可再利用的商品。

Exploring circular economy opportunities also provides the water utilities with an alternative to costly landfilling or other disposal methods.
同时，探索循环经济机会还为水务公司提供了一个替代昂贵填埋或其他处置方法的选择。

Considerations when assessing circular solutions for sludge
评估污泥循环解决方案时的考虑因素

When looking at the alternative options it is necessary to consider both the technological feasibility and costs involved, as well as regulatory requirements and the market need. For example, potable water treatment sludges may contain contaminants that prevent its reuse in some circumstances, and so providing an understanding of how they may hinder circular economy aspirations is important.
在考虑替代选项时，有必要同时考虑技术可行性和相关成本，以及法规要求和市场需求。例如，饮用水处理污泥可能含有污染物，在某些情况下会妨碍其再利用，因此了解这些污染物如何阻碍循环经济的愿景非常重要。

Having a full understanding of the different aspects surrounding the circular economy when it comes to potable water treatment sludges will allow water utilities to prioritise research activities. This will inform business planning in the short, medium and long-term.
充分了解饮用水处理污泥的循环经济相关各方面将使水务公司能够优先考虑研究活动。这将为短期、中期和长期的商业规划提供信息。



How the research was conducted
研究是如何进行的

The review explored literature detailing existing and emerging applications and markets for water treatment sludges. A data request was made to the UK and Ireland water utilities to determine the volume and composition of sludges.
该综述探讨了现有和新兴的水处理污泥应用和市场的文献。向英国和爱尔兰的水务公司发出了数据请求，以确定污泥的体积和成分。

The current outlets for the sludge were summarised and a high-level economic analysis was performed to evaluate which of the identified options held the most potential for the UK and Ireland water industry.
总结了污泥的当前处理方式，并进行了高层次的经济分析，以评估所识别选项中哪些在英国和爱尔兰水行业中具有最大潜力。

What did the research find?
研究发现了什么?

Following further analysis, the research concluded that:
经过进一步分析，研究得出以下结论：

• Based on the available information, at least 115,000 tonnes of dry solids (tds) of water treatment sludge are produced every year. The majority of ferric water treatment sludge is discharged to the sewer system and the majority of alum sludge is used for land spreading. Some sludge is disposed of within landfill.
• 根据现有资料，在污泥处理中每年产生至少 11.5 万吨干固体（tds）。大多数铁水处理污泥排放到污水系统，而大多数铝污泥用于土地施用，另外一些污泥则被填埋处理。

• Alternative outlets and uses for water treatment sludge, include:
• 水处理污泥的替代处理方式和用途包括：

- Use within anaerobic digestion or biogas cleaning for hydrogen sulphide(H_2S) removal
- 用于厌氧消化或沼气净化，以去除硫化氢(H_2S)

- In the ceramics industry as a filler or colourant.
- 在陶瓷工业中作为填料或着色剂。

- Within the construction industry for brick manufacture, cement production and as cementitious material.
- 在建筑行业用于制砖、水泥生产和作为水泥质材料。

- Non-selective or selective coagulant recovery and subsequent reuse within wastewater or water treatment.
- 非选择性或选择性混凝剂的回收及随后在废水或水处理中的再利用。

- As a feedstock for flame retardant production or metal production.
- 作为阻燃剂生产或金属生产的原料。

• There are several treatment processes that can be undertaken to potentially increase the value of water treatment sludge, including thermal treatment, granulation, and acid treatment.
• 有几种处理工艺可以用来潜在地提高水处理污泥的价值，这其中包括热处理、造粒和酸处理。

• Limited data is available on the presence of contaminants and potentially toxic elements within water treatment sludge and the influence this might have on alternative outlets or uses. The risk of their presence causing an issue, however, is low.
• 虽然有关水处理污泥中的污染物和潜在有毒元素存在的数据有限，这可能会影响其替代处理方式或用途，但是它们引发问题的风险很低。

• The options that were considered most viable today, or economically feasible considering the current volumes and composition of water treatment sludge in the UK and Ireland, and the existing processes were:
• 在考虑当前英国和爱尔兰水处理污泥的体积和成分及现有工艺时，被认为最可行或经济可行的选项是：

• For both alum and ferric sludges, non-selective coagulant recovery via acid digestion and use within wastewater treatment for P removal.
• 对于铝污泥和铁污泥，通过酸消化进行非选择性混凝剂的回收，并在废水处理过程中用于去除磷。

• Additionally, for ferric sludges, their use within anaerobic digestion to prevent H_2S formation, or following drying and heat treatment as an adsorbent for biogas cleaning.
• 此外，对于铁污泥，它们在厌氧消化中用于防止 H_2S 的形成，或在干燥和热处理后作为沼气净化的吸附剂。

• Further research and development into more advanced coagulant recovery may enable the use of ferric or alum sludges within drinking water treatment in the future.
• 对于更先进的混凝剂回收的进一步研究和开发可能使铁或铝污泥在未来用于饮用水处理。

• Regulatory requirements perhaps present the greatest barrier to the use of water treatment sludge. End of Waste Status and Reach registration need to be explored.
• 法规要求可能是水处理污泥使用的最大障碍，因此需要探讨废物终止状态和做好登记注册。

What benefits will the report have?
研究将带来什么好处?

The research has provided UK and Ireland water industry with a clear and up to date view of the latest state of play for water treatment sludges, including current and potential outlets. Not only will this research provide robust evidence for water companies when making internal investment decisions on how to approach new technologies or solutions, it will help to steer dialogue and decision-making with regulators.
这项研究为英国和爱尔兰水行业提供了关于水处理污泥最新状态的清晰和最新的视角，包括当前和潜在的处理方式。这项研究不仅为水务公司在内部投资决策中提供了扎实的证据，以决定如何应对新技术或解决方案，还将帮助引导与监管机构的对话和决策。

Recommendations and next steps
建议和下一步计划

The researchers conclude the report with a number of recommendations for further research and opportunities for collaboration within the industry.
研究人员在综述的最后提出了一些关于进一步研究和行业内合作机会的建议。

• Undertake full-scale demonstrations to determine the performance of:
• 进行全规模示范，以确定以下方面的性能：

• The use of ferric sludges in biogas cleaning H_2S reduction.
• 利用含铁污泥在沼气净化中去除 H_2S。

• The use of acid digestion for ferric and alum sludges and then their use within wastewater treatment.
• 对铁污泥和铝污泥进行酸消化，然后在废水处理中使用。

• Undertake pilot scale trials of advanced coagulant recovery for reuse within water treatment.
• 进行先进混凝剂回收的试点规模试验，以便在水处理中的再利用。

• Undertake collaborative projects to progress the work at a national scale including:
• 开展合作项目，以在国家范围内推进工作，包括：

• The demonstration and pilot trials mentioned above.
• 上述示范和试点试验。

• Stakeholder engagement with operators across the water utilities to ensure their needs in terms of coagulant performance or anaerobic digester management are met within the trials.
• 与水务公司运营商的利益相关者互动，以确保在试验中满足他们在混凝剂性能或厌氧消化器管理方面的需求。

• Liaison with the environmental regulators to determine what steps are required to enable the reuse of water treatment sludge beyond land spreading and discharge to sewer.
• 与环境监管机构联系，确定使水处理污泥在土地施用和排放到污水管道之外的再利用所需的步骤。

• Development of a clear road map with timescales, key players and engagement points and points of flex to develop suitable markets for water treatment sludge, internally and externally (as appropriate).
• 制定清晰的路线图，包含时间表、关键参与者以及发展适合水处理污泥的市场灵活点等。

• Determine the most appropriate business model for operating a recovery market for water treatment sludge, be it a public-private partnership, a wholly private enterprise with an external organisation or held just by individual or joint water utilities.
• 确定最合适的商业模式（无论是公私合营、与外部组织的全私营企业，还是仅由个别或联合水务公司持有），以运作水处理污泥的回收市场。

CARBON REMOVAL INVESTMENT BOOSTS CREDIT MARKET
碳去除：未来的投资方向

The integration of carbon removal into existing wastewater infrastructure will accelerate at a significantly faster pace and scale with investment from a climate-focused coalition that includes global retail and tech giants among its members.
在包括全球零售和科技巨头在内的以气候为重点的联盟的投资下，将碳去除纳入现有污水基础设施的速度和规模将大大加快。

Investment boosts carbon removal offtake agreements
投资推动碳去除购买协议

Frontier’ s members will buy €77 million of carbon credits from two separate firms, including from CREW Carbon, a US-based company that uses engineered enhanced weathering to remove CO2 from municipal and industrial wastewater systems.
Frontier 的成员将从两家公司购买价值 7700 万欧元的碳信用额，其中包括来自美国的 CREW Carbon 公司，该公司利用工程增强风化技术从市政和工业废水系统中去除二氧化碳。

CREW Carbon's technology uses and enhances minerals to treat, remove and store CO2 at wastewater treatment plants (WWTP). The company partners with WWTP's to leverage existing infrastructure and to optimise biological treatment to remove the large amounts of CO2 present in WWTPs, using a proprietary carbon monitoring, reporting, and verification (MRV) system, which was developed through years of research at Yale University.
CREW Carbon 公司的技术利用和增强矿物质，是在污水处理厂(WWTP)中处理、去除和储存二氧化碳。该公司与污水处理厂合作，利用现有基础设施优化生物处理，以去除污水处理厂中大量存在的二氧化碳，并使用经过耶鲁大学多年研究开发的专有碳监测、报告和验证(MRV)系统。

In total, Frontier members will pay CREW Carbon to remove 71,878 tons of CO_2 between 2025 and 2030.
总的来说，Frontier 成员将向 CREW Carbon 支付费用，在 2025 年至 2030 年期间减少 71878 吨二氧化碳。

Hannah Bebbington, head of deployment, Frontier told media: “Carbon removal isn’ t just about developing entirely new technologies from the lab, but also building on existing industrial expertise and infrastructure. CO280 and CREW show how we can flip the switch on carbon removal in industrial processes, enabling big scale, fast.”
Frontier 的部署负责人 Hannah Bebbington 在接受媒体采访时表示：“碳去除不仅仅是开发全新的实验室技术，而是建立在现有工业专业知识和基础设施之上。CO280 和 CREW 展示了我们如何在工业过程中开启碳去除的开关，实现大规模、快速的去除。”

How does CREW remove carbon?
CREW如何去除碳?

Wastewater plants generate carbon emissions from the break down of organic waste matter through microbial action. CREW Carbon uses the addition of fine-grained alkaline minerals, such as limestone, which react with carbon dioxide, capturing it as the more stable, aqueous bicarbonate ion.
污水处理厂通过微生物的作用，从有机废物的分解中产生碳排放。CREW Carbon 通过添加细粒碱性矿物质 (如石灰石) 与二氧化碳反应，将其捕获为更稳定的水合碳酸氢根离子。

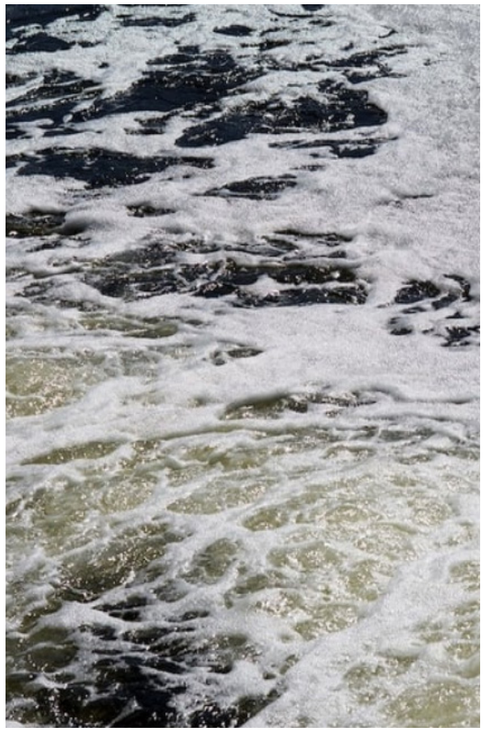
The MRV monitoring system deployed at the inlet and outlet of the plant allows for robust quantification of the amount of carbon captured within the treatment process. The resulting dissolved bicarbonate is then safely discharged to oceans, rivers, or the subsurface where it is stored for thousands of years.
在水厂的进水口和出水口部署的 MRV 监测系统可以可靠地量化处理过程中捕获的碳量，最终溶解的碳酸氢盐会被安全排放到海洋、河流或地下，在那里它被储存了数千年。

In total, Frontier will pay €31 million, or €432 a ton to CREW Carbon. However, Frontier estimates that the approach taken by CREW Carbon is scalable to achieve 500 million tons of carbon removal per year at a cost of less than €96 a ton.
Frontier 总共将支付 3100 万欧元，或每吨 432 欧元给 CREW Carbon 公司。然而，Frontier 估计，CREW Carbon 采取的方法将具有可扩展性，能够以低于每吨 96 欧元的成本实现每年 500 万吨的碳去除。

Dr Joachim Katchinoff, co-founder and CEO, CREW Carbon told media: “Securing this offtake with Frontier buyers enables CREW to accelerate the integration of carbon removal into existing wastewater infrastructure at a significantly faster pace and scale. This agreement not only allows us to expand our existing CO_2 removal projects but also benefits the wastewater sector by enabling safer and efficient wastewater treatment.”
CREW Carbon 的联合创始人兼首席执行官 Joachim Katchinoff 博士在接受媒体采访时表示：“与 Frontier 甲方达成的这一购买协议使 CREW 能够以显著更快的速度和规模加速将碳去除整合到现有污水基础设施中。这项协议不仅使我们能够扩展现有的二氧化碳去除项目，还使污水行业受益，从而实现更安全和高效的污水处理。”

He added: “Frontier’ s support validates our mission to deliver measurable, permanent, and scientifically robust carbon removal today. This opportunity enables CREW to develop carbon removal in closed-system wastewater plants while informing how we do alkalinity-based carbon removal in

open-systems across Earth's water cycle."
他补充道："Frontier 的支持验证了我们的使命，即在今天提供可测量、永久和科学严谨的碳去除。这一机会使 CREW 能够在封闭系统的污水处理厂中开发碳去除，同时为我们在地球水循环中如何进行基于碱度的碳去除提供指导。"



Frontier coalition members invest in carbon capture
Frontier联盟成员投资碳捕集

Frontier was founded by Stripe, Google, Shopify, and McKinsey Sustainability. The carbon credit purchase also included members Autodesk, H&M Group, Workday and Salesforce, with further purchases made by Aledade, Canva, Match Group, Samsara, SKIMS, Skyscanner, Wise, and Zendesk via Frontier' s partnership with Watershed, a carbon removal platform provider.
Frontier 由 Stripe、Google、Shopify 和 McKinsey 可持续发展公司共同创立。此次购买碳信用额度的公司还包括 Autodesk、H&M 集团、Workday 和 Salesforce 等，Aledade、Canva、Match Group、Samsara、SKIMS、Skyscanner、Wise 和 Zendesk 也通过与碳去除平台提供商 Watershed 的合作进行了进一步购买。

As well as buying credits from CREW Carbon, the investors also bought offtake agreements from CO2080, a US-based company that develops Biomass Carbon Removal and Storage (BiCRS) projects at pulp and paper facilities.
除了从 CREW Carbon 购买碳排放额度外，投资者还从美国公司 CO2080 购买了碳去除和储存（BiCRS）项目的购买协议，该公司在纸浆和造纸设施中开发相关项目。

AQUA TECHNOLOGY

FEDERATION CALLS FOR BAN ON ALL NEW PFAS USAGE
无毒未来：呼吁全欧洲禁用PFAS

Use of per- and polyfluoroalkyl substances (PFAS) in consumer products should end immediately if the world is to have a chance of tackling the so-called forever chemicals, according to a report published by EurEau, the European federation of national associations of water services.
根据欧洲国家供水服务协会联合会（EurEau）发布的一份报告，为了应对所谓的"永久化学物质"问题，应立即停止使用含有全氟 / 多氟烷基化合物（PFAS）的消费品。

A chance to make drinking water safe for all
为所有人提供安全的饮用水

EurEau has long called for greater action on tackling the problems posed by continued use of PFAS. The federation believes a ban is essential to prevent further contamination and to 'ensure the availability of safe, affordable water for all'.
EurEau 长期以来一直呼吁采取更多措施来解决 PFAS 持续使用所带来的问题。该联邦认为，禁止 PFAS 的使用对于防止进一步污染以及 "确保所有人获得安全、可负担的水"来说至关重要。

EurEau president Pär Dalhielm told media: "Our water service providers work tirelessly to deliver clean, safe, and affordable water to everyone. A universal ban on PFAS will not only help safeguard health but will also drive innovation and economic growth by encouraging the development of safer alternatives. The cost of inaction is far too high, especially if human health is at stake."
EurEau 主席 Pär Dalhielm 告诉媒体："我们的供水服务人员在不懈努力地为每个人提供干净、安全和可负担的水。对 PFAS 的全面禁令不仅有助于保障健康，还将通过鼓励开发更安全的替代品来推动创新和经济增长。如果不采取行动，则会威胁人类健康，这一代价十分高昂。"

French press critical of EU policymakers
法国媒体批评欧盟政策制定者

Dalhielm's statement follows the publication of an investigation led by French newspaper Le Monde, which highlighted the need for EU policymakers to enforce a comprehensive ban on the continued use of PFAS chemicals. This involved 46 journalists and 28 media partners from 16 countries, and led to the conclusion that the cost of cleaning up PFAS pollution could top €1.9tn in UK and Europe
在 Dalhielm 发表声明前，法国《世界报》(Le Monde) 发布了一项调查，该调查强调了欧盟政策制定者需要对 PFAS 化学物质的持续使用实施全面禁令。这项调查涉及来自 16 个国家的 46 名记者和 28 家媒体合作伙伴，得出的结论是，清理 PFAS 污染的成本可能超过 1.9 万亿欧元。

The investigation was based on 14,500 previously unpublished documents and included filing 180 freedom of information requests (FOIs), 80 of which were shared to the journalists by Corporate Europe Observatory.
这项调查基于 14500 份以前未公开的文件，包括 180 份提交的信息自由请求 (FOIs)，其中 80 份由欧洲公司观察组织（Corporate Europe Observatory）分享给了记者。

EurEau also published a paper - PFAS: a pre-requisite for a water resilient Europe – which highlights the impact of continued PFAS use on water resources and the financial cost of removing them from the water cycle.
EurEau 还发表了一篇论文——《PFAS：建设水资源韧性欧洲的前提条件》，强调了 PFAS 持续使用对水资源的影响以及从水循环中去除 PFAS 的资金成本。

As EurEau highlights, while a ban would halt the flow of PFAS to water sources, land, and into the human food chain, there will still be a need to treat the chemicals already present in those environments, with the drinking water sector facing an annual increase of up to €18 billion in treatment costs, and the cost on the wastewater and sludge management side is much higher.
正如 EurEau 所强调的，虽然禁令将停止 PFAS 流入水源、土地和人类食物链，但仍需要处理已经存在于这些环境中的 PFAS。仅饮用水行业每年就要多支出 180 亿欧元处理费用，而污水和污泥管理方面的成本则更高。

What is the European Union doing to address PFAS concerns?
欧盟在解决PFAS问题方面采取了什么措施?

The European Commission has suggested focusing on clarity regarding PFAS, while tightening controls on subsets of the chemical family. For example, in 2024, the use of undecafluorohexanoic acid ('PFHxA') and PFHxA related substances were restricted under the EU's REACH Regulation, although these were subject to various conditions and timelines.
欧盟委员会建议关注 PFAS 的明确界定，同时加强对这一化学物质的控制。例如，在 2024 年，根据欧盟的 REACH 法规，限制了全氟己酸 ("PFHxA") 及其相关物质的使用，尽管这些限制受各种条件和时间表的约束。

The European Commission released at statement at the time, stating: "The restriction on this sub-group of PFAS is one more milestone that brings us closer to a toxic-free environment. Our EU rules allow us to restrict harmful substances when there are safe alternatives. To the benefit of all consumers and for a green transformation of our society."
当时，欧盟委员会发布了一份声明，表示："对 PFAS 的限制是我们迈向无毒环境的又一个里程碑。欧盟规定允许我们在有安全替代品的情况下限制有害物质。这将惠及所有消费者，并推动我们社会的绿色转型。"

EurEau recommendations
EurEau的建议

However, EurEau wants Europe's policymakers to go further. In the forward to its report, it states: "Only a prompt and far-reaching PFAS ban can ensure that PFAS exposure in future generations will gradually approach safe levels again."
然而，EurEau 希望欧洲的政策制定者能够进一步行动。在其报告的前言中，EurEau 指出："只有迅速而广泛的 PFAS 禁令才能确保未来几代人的 PFAS 暴露逐渐接近安全水平。"

Addressing policymakers and acknowledging the tough nature of policy decisions that affect so many areas of work, life and the environment, the report states: "How much harm to people and the environment is tolerable to protect PFAS applications - some of which are highly useful for society? Which additional costs/losses for healthcare, food production, water services, tourism and soil decontamination are acceptable compared to the costs of transitioning towards a future-proof chemical industry?"
报告首先指出这类政策抉择的复杂性——因其牵涉工作、生活与环境等方方面面，继而抛出一组发人深省的追问："若保留某些对社会极具价值的 PFAS 应用，人类健康与生态环境需承受多大程度损害？与向未来化学工业转型的成本相比，医疗、食品生产、供水服务、旅游业及土壤修复等领域额外成本 / 损失是否可以接受？"

The EurEau report ends with the following recommendations for policymakers:
EurEau 报告最后对政策制定者提出了以下建议：

- Support a far-reaching ban for PFAS used in products made inside and outside the EU: Policy makers and stakeholders should support the ECHA 'universal PFAS restriction' process and the European Commission should add the restriction to annex XVII of the REACH Regulation without undue delay. "We simply cannot afford continued PFAS emissions to the aquatic environment."
- 支持对在欧盟内外制造的产品中使用 PFAS 的广泛禁令：政策制定者和利益相关者应支持欧洲化学品管理局 (ECHA) 的"全面 PFAS 限制"过程，欧盟委员会应立即将该限制添加到 REACH 法规的附录 XVII 中。"因为我们根本无法承受 PFAS 持续排放到水环境中所带来的影响。"

- Prolong PFAS use only in certain essential applications for a limited time: Some PFAS uses, for example in medical applications, might be essential for people's health. In line with the [EU] Commission's approach, these applications might enjoy longer transition periods, provided PFAS release to the environment is minimised and the end-of-life management is subject to strict certification. With a view to protecting our drinking water, the WHO advises its member countries that "all non-essential uses of PFAS should be stopped".
- 仅在某些必要应用中延长 PFAS 的使用时间：某些 PFAS 的用途，例如在医疗应用中，可能对人们的健康至关重要。根据欧盟委员会的做法，这些应用可能享有更长的过渡期，前提是尽量减少 PFAS 对环境的释放，并且生命周期管理受到严格认证。为了保护我们的饮用水健康，世卫组织建议其成员国"应停止所有非必要 PFAS 的使用"。

• Ban PFAS in fire-fighting foams: Fire-fighting foams have caused dramatic local PFAS pollution across our continent and alternatives are available.
• 禁止在消防泡沫灭火器中使用 PFAS：泡沫灭火在我们整个大陆造成了严重的地方性 PFAS 污染，并且已有替代品可用。

• Tackle PFAS in plant protection products: The European Commission should immediately withdraw the authorisation for all PFAS-containing plant protection products and biocides, particularly those that lead to the formation of TFA. Available data suggest that their use is leading to the accumulation of this substance in soil and groundwater.
• 植物保护产品中的 PFAS 问题：欧盟委员会应立即撤销所有含 PFAS 植物保护产品和生物杀虫剂的授权，特别是那些导致三氟乙酸（TFA）形成的产品。现有数据表明，它们的使用会导致这种物质在土壤和地下水中积累。

• Set health-derived limit values for PFAS including TFA in drinking water and food accompanied by strict control-at-source measures to avoid PFAS release to the environment.
• 为饮用水和食品中的 PFAS（包括 TFA）设定健康导向的限值，并设置严格的源头控制措施，以避免 PFAS 释放到环境中。

• Provide a long-term framework: Regulation drives innovation. Only a clear phase-out date, possibly, supplemented by a short transition period, provides the regulatory framework that stimulates investment in alternative solutions. PFAS are increasingly restricted in other parts of the world. Europe can become a forerunner in developing PFAS-free alternatives.
• 提供长期框架：法规推动创新。只有明确的逐步淘汰日期，或者一个短暂的过渡期，才能促进对替代解决方案投资的监管框架。随着 PFAS 在世界其他地区越来越受到限制，或许欧洲可以成为开发无 PFAS 替代品的先行者。

• Make the polluter pay: PFAS pollution costs billions of euros every year. These costs are today borne by water operators, municipalities, health insurances, governments, and others. By incorporating these costs in the PFAS price, we will not only bring fairness to the protection of people and the environment, but also make alternative, more sustainable solutions more competitive. Public authorities should provide complementary financing.
• 让污染者付费：PFAS 污染每年花费数十亿欧元。这些成本目前由水务运营商、市政府、健康保险、政府及其他方承担。通过将这些成本纳入 PFAS 价格，我们不仅能在保护人类和环境方面实现公平，还能让替代的、可持续的解决方案更具竞争力。公共当局应提供补充融资支持。

• Promote innovation: The EU's research programmes should support the development of adequate and more sustainable PFAS substitutes and PFAS removal and destruction technologies.
• 促进创新：欧盟的研究计划应支持开发充分且更可持续的 PFAS 替代品以及 PFAS 去除和销毁技术。

AI STORM WATER MANAGEMENT RECEIVES INVESTMENT BOOST
千万元投资：AI助力雨水管理

Belfast-based software company, StormHarvester, has received €10 million investment that will help the company move into new markets and further develop its AI automated wastewater management software platform.
总部位于 Belfast 的软件公司 StormHarvester 获得了 1000 万欧元的投资，这将帮助公司拓展新市场并进一步开发其人工智能自动化废水管理软件平台。

Tackling flooding and pollution events
应对洪水和污染事件

The company launched its automated water management software platform in 2019 and has experienced healthy growth ever since. Its software-as-a-service (SaaS) offering was built in-house and uses machine learning and rainfall prediction to help wastewater utilities prevent and tackle flooding and pollution events. Customers access the software using a secure portal.
StormHarvester 公司于 2019 年推出了其自动化水管理软件平台，自那时起，公司一直保持稳定增长。其软件即服务（SaaS）产品为内部开发，利用机器学习和降雨预测，协助废水公用事业公司预防和应对洪水及污染事件。客户可通过安全门户轻松访问该软件。

By using predictive analytics and anomaly detection, for example, sewer blockages, monitor pumping station anomalies, and inflow and infiltration in sewer networks, the platform can identify potential issues before they occur.
该平台通过预测分析和异常检测，能够监测下水道堵塞、泵站异常，以及下水道管网中的流入和渗透，从而在潜在问题发生之前提前识别。

A seat on the board for investment round leaders
投资轮领导者的董事会席位

Announcing the investment, StormHarvester CEO, Brian Moloney, said: "This significant investment represents a transformative step in our company' s journey, fuelling our expansion and creating exciting opportunities for Northern Ireland's job market."
在宣布这项投资时，StormHarvester 首席执行官 Brian Moloney 表示："这一重要投资标志着我们公司旅程中的一个转折点，将推动我们的扩张，并为北爱尔兰的就业市场创造令人兴奋的机会。"

"We' re thrilled to announce new positions spanning sales and marketing roles to drive our global reach, alongside cutting-edge technical roles that will shape the future of our smart technology as we advance our innovative product roadmap."
他补充道："我们很高兴宣布新职位，涵盖销售和市场营销角色，以提升我们的全球影响力，同时还将设立尖端技术岗位，塑造我们智能技术的未来，推动我们的创新产品路线图。"

The investment was made by Leeds-based YFM Equity Partners (YFM), specialists in helping small business scale and grow at pace, and Emerald Technology Ventures, a company dedicated to investing in start-ups that tackle challenges in climate change and sustainability.
此次投资由总部位于利兹的 YFM Equity Partners（YFM）和 Emerald Technology Ventures 共同进行。YFM 专注于帮助小企业快速扩展和成长，而后者则致力于投资应对气候变化和可持续性挑战的初创公司。

As a result, both companies will have representation on the StormHarvester board.
因此，这两家公司将在 StormHarvester 的董事会中占有席位。

YFM partner, Mike Clarke, told media: "Having been the first to market in the UK, the StormHarvester team has carved out a market-leading position, expanding to meet ever-growing demand from the utilities sector. The company is now focused on international expansion, and we are excited to be supporting its scale-up journey."
YFM 合伙人 Mike Clarke 告诉媒体："作为英国市场的首个参与者，StormHarvester 团队已建立了市场领先地位，以满足公用事业部门日益增长的需求。公司现在专注于国际扩展，我们很高兴能支持其发展之旅。"

He added: "More importantly, we are immensely proud to be associated with a company that is making a tangible difference in reducing pollution and flooding. By enabling utilities to proactively manage their networks, StormHarvester's technology is setting a new standard in environmental stewardship and sustainability."
他进一步指出："更重要的是，我们感到无比自豪能够与这样一家在减少污染和洪水方面产生切实影响的公司合作。StormHarvester 的技术使公用事业公司能够主动管理其网络，目前正在设定环境管理和可持续发展的新标准。"

Clayton MacDougald, investment director at Emerald Technology Ventures, will join the board. He told Aquatech Online: "Emerald reviews over 2,000 startups a year, and what stood out about StormHarvester was the impressive team, company growth and the amazing relationship the company has with their customers."
Emerald Technology Ventures 的投资总监 Clayton MacDougald 将加入董事会。他对 Aquatech Online 表示："Emerald 每年审查超过 2000 家初创公司，而 StormHarvester 给我留下深刻印象的是其卓越的团队、公司的快速增长以及与客户之间的良好关系。"

"What excites me about the potential is the global market demand for smart solutions in the sewer space, and how this demand will only continue to grow as the impacts of climate change continue to make things more challenging for utilities around the world."
他补充道："全球市场对下水道领域智能解决方案的需求让我感到兴奋，这种需求只会随着气候变化的影响而不断增加，使公用事业面临更大的挑战。"

What the investment will help to achieve
投资将帮助实现的目标

StormHarvester was founded in 2017 by Brian Moloney, who had a strong desire to improve wastewater network performance. At the time, he could see an opportunity to improve performance using a more data-centric approach, and the company' s initial work centred on understanding the relationship between rainfall and draining networks. The focus later turned to predicting future network performance using rainfall datasets.
StormHarvester 于 2017 年由 Brian Moloney 创立，他希望通过数据驱动的方法改善废水管网的性能。公司最初的工作集中在理解降雨与排水管网之间的关系，随后转向利用降雨数据集预测未来管网性能。

He said on the company' s LinkedIn page: "Expensive-to-replace networks, urbanization, climate change, and population growth are putting a huge strain on wastewater systems, and this has resulted in increased flooding and pollution. StormHarvester' s AI solution is solving these problems, identifying issues before they happen and facilitating proactive intervention."
在公司的 LinkedIn 页面上，他表示："昂贵的更换管网、城市化、气候变化和人口增长对废水系统造成了巨大压力，导致洪水和污染增加。StormHarvester 的人工智能解决方案正致力于解决这些问题，能够在问题发生之前识别并促成主动干预。"

He added: "Our technology not only improves operational efficiency for utilities but also plays a critical role in reducing pollution, protecting vital water resources, and supporting a healthier environment."
他补充道："我们的技术不仅提高了公用事业公司的运营效率，还在减少污染、保护重要水资源和支持更健康的环境方面发挥了关键作用。

The investment will help the company to double its workforce over the next three years. The roles will be primarily focused on software development with additional roles in marketing and sales to help accomplish its aims of pushing into new markets, especially Australasia and North America. The current SaaS will work in any territory without the need for any adaptation, while the expansion of the software development team will help the company further develop its product range.
这项投资将帮助公司在未来三年内将员工人数翻倍。新职位主要集中在软件开发，同时市场营销和销售领域也将增加岗位，以支持公司进入新市场的目标，特别是澳大利亚和北美。当前的 SaaS 产品可在任何地区无须适应即可使用，而软件开发团队的扩展将进一步推动公司产品系列的发展。

EUROPE EDGES CLOSER TO WATER RESILIENCE STRATEGY
欧洲水韧性战略

The European Parliament has published its draft report on water resilience with key recommendations for the European Commission to consider as the strategy moves toward adoption.
欧洲议会发布了关于水韧性报告草案，其中，包含了对欧洲委员会在该战略采纳过程中应考虑的关键性建议。

Water resilience at the heart of European Commission
水韧性是欧洲委员会的核心议题

Water resilience was put at the heart of the European Commission's 2024-2029 five-year plan by President Ursula von der Leyen. Announcing the strategy, Von der Leyen stressed the need to adopt a circular economy approach to ensure the proper management of water sources, address scarcity, and enhance the digitalisation of the water industry.
Ursula von der Leyen 主席提出，水韧性战略在欧盟 2024~2029 五年规划中处于核心地位。在该战略被宣布之时，Von der Leyen 就强调了通过采用循环经济的方法来确保适当管理水资源、解决水资源短缺问题并提高水行业数字化水平的必要性。

The draft report was written by rapporteur Thomas Bajada on behalf of the Committee on the Environment, Climate and Food Safety.
该报告草案由环境、气候与食品安全委员会特派调查员 Thomas Bajada 编写。

Praise from industry bodies
行业机构的赞誉

The publication of the draft report was greeted positively by the water sector. EurEau, the European Federation of National Associations of Water Services, which represents national drinking and wastewater service providers from 33 countries, from both the private and the public sectors welcomed recommendations calling for dedicated water funding, addressing pollution at the source, and embedding water resilience into all EU policies.
该报告草案的发布在水务行业中获得了积极反响。EurEau（欧洲水务服务国家协会联合会，代表来自 33 个国家私营或公共部门的饮用水和污水服务商）欢迎报告草案中关于设立专门水资源基金、源头控制以及将水韧性纳入所有欧盟政策的建议。

In a prepared statement, the federation stated: "We welcome the draft report's recommendations, which will feed the commission's work on the upcoming Water Resilience Strategy. Rapporteur Bajada's text rightly recognises that water resilience needs to become part of how every economic sector operates, including through binding water efficiency targets set at basin level as well as better enforcement of pollution limits."
在一份声明中，该联合会表示："我们对报告草案建议表示欢迎，这些建议将为欧盟委员会即将制定的水韧性战略提供参考。特派调查员 Bajada 的草案正确地认识到了水韧性需要成为每个经济部门运作方式的一部分，包括通过在流域层面设定具有约束力的用水效率目标以及更好地执行污染限制。"

It finished by stating: "We look forward to working constructively with MEPs through the amendment process."
声明最后表示："我们期待在草案修正过程中与欧洲议会议员进行建设性合作。"

The growing need for a water resilience strategy
日益增长的水韧性战略需求

The draft report makes very clear the need for a Water Resilience Strategy:
该报告草案明确指出了水韧性战略的必要性：

- Water stress is already affecting 20 per cent of Europe's territory and 30 per cent of the population on average every year, figures that are likely to increase in the future on account of climate change.
- 每年，欧洲平均有 20% 的地区和 30% 的人口受到水资源压力的影响。预计这一比例还可能会因为气候变化加剧而增加。

- The deadline set by the Water Framework Directive (WFD) for European rivers, lakes, transitional, coastal and groundwaters to achieve 'good' status was 2015; however, by 2021, only 37 per cent of Europe's surface water bodies achieved 'good' or 'high' ecological status, while 29 per cent achieved 'good' chemical status.
- 《水框架指令》(WFD)规定，欧洲河流、湖泊、过渡带、沿海和地下水达到“良好”状态的最后期限为 2015 年。然而，到 2021 年，只有 37% 欧洲地表水体达到“良好”或“高水平”生态状态；与此同时，29% 的地表水体达到了“良好”的化学状态。

- Industry accounts for approximately 40 per cent of total water abstraction in Europe; however, data on water abstraction and use in the EU is historical and poor.
- 欧洲工业用水量大约占总取水量的 40%。然而，欧盟关于取水和用水数据仍较为陈旧且不足。

- The objective of achieving good chemical status for all EU water bodies by 2027 remains far from being achieved.
- 到 2027 年实现欧盟所有水体化学状态良好的目标仍然遥不可及。

- Groundwater supplies 65 per cent of water for drinking and 25 per cent of water for agricultural irrigation in the EU; it is a finite resource that needs to be protected from pollution and over-exploitation.
- 欧盟 65% 饮用水和 25% 农业灌溉用水由地下水供给；地下水是一种有限资源，需要防止污染和过度开发。

• The lack of EU-wide quality standards for per- and polyfluoroalkyl substances (PFAS) in groundwater and insufficient monitoring of less-studied PFAS compounds exacerbate the challenge of achieving good chemical status for EU water.
• 欧盟范围内缺乏针对地下水中全氟和多氟烷基物质(PFAS)统一的质量标准，也未能充分监测那些尚未得到充分研究的 PFAS 化合物。这进一步加剧了实现欧盟水体"良好"化学状态的难度。

• Occurrences of prolonged drought, extreme heat and large-scale flooding events are expected to increase throughout the continent, damaging ecosystems and human health, and leading to major disruption to economic activities.
• 预计整个欧洲大陆发生长期干旱、极端高温和大规模洪水事件的频率将会增加。这将严重损害生态系统和人类健康，并对经济活动造成重大干扰。

• Preserving water resources and the natural flow of rivers while supplying sufficient water of good quality is becoming a major challenge.
• 保护水资源和河流自然流动，同时确保提供充足的优质水正成为一项重大挑战。

• The current multiannual financial framework (MFF) includes an ambitious but non-binding target of dedicating at least 7.5 per cent of annual EU spending to biodiversity objectives in 2024 and 10 per cent in both 2026 and 2027.
• 目前多年度财政框架 (MFF) 包括一个雄心勃勃但非强制性目标，即，到 2024 年，至少将欧盟年度支出的 7.5% 用于生物多样性目标。这一比例在 2026 年和 2027 年则分别为 10%。

• 60 per cent of European river basin districts are transnational, which makes effective transboundary cooperation crucial.
• 60% 欧洲河流流域是跨国界的。因此，开展有效的跨境合作至关重要。

Recommendations for the EU Commission
对欧盟委员会的建议

The author of the draft report made a number of recommendations based on six pillars for the commission to consider ahead of the strategy being adopted. The six key pillars address the areas outlined above: Water efficiency, pollution mitigation, climate adaptation, funding, digitalisation and innovation, and cross border cooperation.
该报告草案作者基于 6 个核心提出了一些建议，供委员会在采纳水韧性战略之前参考。这 6 个关键核心涵盖了以上提到的领域：用水效率、污染缓解、气候适应、资金支持、数字化、创新以及跨境合作。

The overall strategy, the report makes clear, requires 'moving away from the outdated perception of water as an infinite resource, to recognising its intrinsic value as being essential to addressing environmental, social, and economic challenges Europe faces today, and in the near future'.
报告明确指出，整体战略需要"摒弃将水视为无限资源的过时观念，转而认识到其内在价值，作为解决欧洲当前和未来所面临的环境、社会和经济挑战之关键"。

Report recommendations include:
报告的建议包括：

• Water sustainability must be a cornerstone of all EU policies.
• 水资源可持续性必须是所有欧盟政策的基石。

• Every policy should be assessed for its impact on water resources, including quality, quantity, and accessibility.
• 每一项政策都应评估其对水资源的影响，包括水质、水量和可获取性。

• Bind sectoral water efficiency and abstraction targets for agriculture, industry, and domestic use, tailored to basin-level assessments.
• 根据流域水平评估，为农业、工业以及居民用水设定行业用水效率和取水目标。

• An evidence-based approach, supported by enhanced data collection and digital tools, is vital to effectively monitor and enforce these targets.
• 采用基于数据的方法，支持加强数据收集和数字化工具，以有效监控和执行这些目标。

• Innovative water management practices must be prioritised to address water scarcity.
• 必须优先推动创新水资源管理措施，以应对水资源短缺问题。

• Agriculture and industry, as two of the most significant water users, but also contributors to our food and economic security, must adopt efficient practices to balance their economic and environmental contributions.
• 农业和工业作为两个用水大户，也是食品和经济安全的贡献者，必须采取有效措施来平衡其经济和环境影响。

• Encouraging innovation, fostering knowledge exchange, and implementing sustainable practices are crucial steps to ensure responsible water use across sectors.
• 鼓励创新、促进知识交流和实施可持续实践是确保各行业负责任用水的关键步骤。

• There is an urgent need for stricter enforcement of the Water Framework Directive (WFD) and related legislation to combat chemical pollution in water.
• 急需加强对《水框架指南》(WFD)和相关立法的严格执行，以应对水体中的化学污染。

• Establishing EU-wide quality standards for PFAS in groundwater and surface water is crucial.
• 建立欧盟范围内地下水和地表水中 PFAS 的质量标准至关重要。

• The common agricultural policy funding should support the transition to low-input and organic farming practices to reduce reliance on chemical pesticides and fertilizers.
• 共同农业资金应该支持向低投入和有机农业转型，以减少对化学农药和化肥的依赖。

• Climate adaptation is fundamental to making the European Water Resilience Strategy a future-proof tool.
• 气候变化适应是使欧洲水韧性战略成为面向未来的有效工具基础。

• Member States must develop comprehensive drought and flood management plans that incorporate digital monitoring and early warning systems.
• 各成员国必须制定针对干旱和洪水的综合管理计划，并将其纳入数字监测和预警系统。

• Adequate funding is a cornerstone of the strategy, supporting infrastructure modernisation, innovative technologies, and nature-based solutions.
• 充足资金支持是该战略的基石，以支持基础设施现代化、技术创新和基于自然的解决方案。

• Digital tools, artificial intelligence, and smart water technologies can revolutionise water management and monitoring.
• 数字工具、人工智能和智能水资源技术有望革新水资源管理和监测方式。

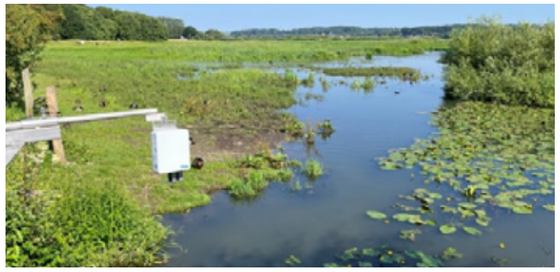
• Member States should prioritise knowledge sharing and capacity building.
• 各成员国应该优先进行知识共享与能力建设。

• Water resilience is a transboundary challenge requiring strong international and regional collaboration.
• 水资源韧性是一个跨境挑战，需要强有力的国际和区域合作。

WIRELESS SENSORS MONITOR SEWER OVERFLOWS IN A REMOTE AREAS
AARHUS VAND：无线传感器革新污水监测！

Danish water supplier Aarhus Vand is using Dryp sensors in remote sewer pipes to improve monitoring of overflows and to reduce the number of physical site inspections needed.
丹麦水务供应商 Aarhus Vand 正在偏远的污水管道中使用 Dryp 传感器，以改善溢流监测并减少所需的现场检查次数。

Remote parts of the water network
污水管网的偏远部分



The Aarhus Municipality has a number of remote areas where few people visit. In these areas, low-fall pipes are called 'risk pipes' because of the possibility that if a problem occurs it can go undetected for a long time.
Aarhus 市有一些鲜有人光顾的偏远地区，在这些地区，低洼管道被称为"风险管道"，因为如果出现问题，可能会长时间不被发现。

These risk pipes, as well as the rest of the rain and wastewater sewers in the municipality are inspected every month by 28 risk management teams. A problem occurring after one visit could therefore last almost an entire month before it is detected and fixed.
这些风险管道以及市政内其他雨水和污水管道每个月由 28 个风险管理团队进行检查。因此，在一次检查后出现的问题可能会持续近一个月才能被发现和解决。

This method of monthly monitoring also involves a great deal of driving around and is considered inefficient as most of the time the sewer pipes are working normally.
这种每月监测的方法还涉及到大量的驾驶过程，效率非常低下，因为在大多数时间内污水管道都是正常运作的。

Utilising remote monitoring to improve efficiency
利用远程监测提高效率

To improve efficiency and to provide regular monitoring, Aarhus Vand is installing six wireless level sensors in selected sewers. The sites have been chosen because they are either in need of regular inspection, or conversely are rarely inspected.
为了提高效率并提供定期监测，Aarhus Vand 正在选定的污水管道中安装六个无线液位传感器。而选择这些地点的条件是它们要么需要定期检查，要么很少视察。

The sensors measure the amount of water in the pipes and warn the operators when the water level reaches a critical target where there is a risk of overflow and thus requires action. This will result in more targeted visits from risk management teams, resulting in problems being addressed as they arise rather than following the next scheduled visit, resulting in huge efficiency savings. For example, the company estimates, three hours every week can be saved on one inspection by remotely capturing sensor data.
传感器测量管道中的水量，并在水位达到溢流风险的临界目标时警告操作人员，从而需要采取行动。这将使得风险管理团队更加有针对性地进行访问，使问题在出现时得到解决，而不是等到下次检查，从而大大节省效率。例如，该公司估计，通过远程捕获传感器数据，每周可以在一次检查中节省三个小时。

Evaluation for further deployment
进一步部署的评估

The first sensors will be deployed in Aarhus city centre, Studstrup and Solbjerg. Other sites will be considered, but the company does not see the value in simply placing sensors throughout the sewer system.
首批传感器将在 Aarhus 市中心、Studstrup 和 Solbjerg 部署，其他地点也会考虑，但该公司认为，仅仅在整个污水系统中放置传感器并没有价值。

Instead, each potential site will be assessed according to a number of criteria, such as whether they create value for the working environment by minimising the number of times Aarhus Vand's operators have to open a sewer cover located in middle of a road or whether it is economically worthwhile to install a sensor.
相反，每个放置地点将根据多个标准进行评估，例如它们是否通过减少 Aarhus Vand 操作人员在道路中间打开污水井盖的次数为工作环境创造价值，或安装传感器是否经济上划算。

Dryp sensors and visualisation tools
Dryp传感器和可视化工具

The sensors being used are supplied by Dryp, of which Aarhus Vand was one of the co-founders. Dryp sensors are designed to monitor and manage water infrastructure, collecting data on various aspects of the water cycle including rainfall, sewer systems, drinking water, and natural streams.
所使用的传感器由 Dryp 公司提供，Aarhus Vand 是其联合创始人之一。Dryp 传感器旨在监测和管理水基础设施，收集有关水循环各个方面的数据，包括降雨、污水系统、饮用水和自然溪流。

The data can be packaged and managed using the company's Lens AI software to process and visualise from a number of different sources. This can provide general overviews to deeper insights and predictions, which can alert operators to potential issues that might develop or warn of overflow events as they happen.
这些数据可以使用该公司的 Lens AI 软件进行打包和管理，以处理和可视化来自多个不同来源的数据。这可以为更深入的洞察和预测提供总体概述，及时提醒操作人员潜在问题的发生或警告溢流事件的发生。

AQUA
TECHNOLOGY

VALUE RECOVERY THROUGH NOVEL DESALINATION PROCESS
盐水变宝泉：一种新型海水脱盐脱盐工艺

A student researcher at the University of Texas at El Paso (UTEP) has developed a method of brine desalination that can convert 90 per cent of salt water to fresh water, while recovering more valuable materials than conventional processes that rely solely on Reverse Osmosis (RO).
德克萨斯大学埃尔帕索分校 (UTEP) 的一名研究生开发了一种新型脱盐工艺，可以将 90% 的盐水转化为淡水。同时，相比仅靠反渗透 (RO) 传统工艺，该方法能回收更多有价值材料。

Professor's challenge leads student to brine solution
教授引领学生挑战卤水解决方案

Tayia Oddonetto was a student at the university when her professor set a challenge during a class she was taking. "[They] said if someone discovered how to turn brine, water with a high salt concentration, into something of value, it'd be revolutionary for the planet."
Tayia Oddonetto 是该大学的一名学生，当时她的教授在一堂课上向她提出一项挑战，“如果有人发现了如何将高浓度盐水变成有价值的东西，这对地球来说将是革命性的。”

This was the prompt Oddonetto needed: "At that moment, I told myself I was going to be the one who found the solution for brine, and that thought has never left me."
正是 Oddonetto 想听到的：“从那刻起，我告诉自己，我将是那个找到卤水解决方案的人，这个想法从未离开过我。”

Oddonetto's perseverance paid off. Her UTEP research on brine desalination - a novel method that can convert over 90 per cent of salt water to fresh water - earned her first place and funding from the National Science Foundation (NSF) Engineering Research Centers Perfect Pitch Competition.
Oddonetto 的坚持得到了回报。她在 UTEP 进行的海

水淡化研究——一种能将 90% 以上的海水转化为淡水的新方法——她赢得了第一名，并获得了美国国家科学基金会(NSF)工程研究中心最美投稿大赛资助。

Choosing salt-free electrodialysis metathesis
选择无盐电渗析合成法

Oddonetto, now a doctoral student in environmental science and engineering, specifically developed and pitched salt-free, electrodialysis metathesis, a novel approach to the desalination of brine, or salt, water. The technique is described in the December 2024 issue of the journal Desalination, and differs from reverse osmosis (RO), a process by which salt in water is removed.
Oddonetto 现在是环境科学与工程专业的博士生，她专门开发并投入无盐电渗析合成技术，这是一种淡化含盐水的新方法。2024 年 12 月出版的《海水淡化》(Desalination)杂志介绍了这项技术，它不同于去除水中盐分的反渗透技术(RO)。

Oddonetto told Aquatech Online: "Salt free electrodialysis metathesis seemed like a natural choice to pilot, the technology keeps constituents that would normally be problematic (Calcium, Sulfate) in separate streams."
Oddonetto 告诉 Aquatech Online：“无盐电渗析合成似乎是实验的自然选择，该技术通常让产生问题的成分(钙、硫酸盐)可以分流。”

The beauty of this approach is that more water can be squeezed out of the system (achieving a higher hydraulic recovery) because you do not need to run the risk of precipitating salts on the membrane surface.
这种方法的优点是可以从系统中分离出更多的水，实现更高的水回收率，且不需要承担在膜表面沉淀盐分的风险。

She added: "The previous iteration of electrodialysis metathesis required the addition of NaCl, I found that counterintuitive because you're adding salt to water that is already salty. We use special monovalent ion exchange membranes to select for the NaCl already in the feed, meaning that this is a chemical free process."
她补充说：“以前的电渗析合成需要添加 NaCl，我觉得这有悖常理，因为你是在已经很咸的水中添加盐。而我们使用特殊的单价离子交换膜来选择进水中已经存在的氯化钠，这意味着这是一种不含化学物质的工艺。”

Moving beyond RO limitations
超过反渗透的限制

According to Oddonetto, RO's main drawback is that it has a limited water recovery and only converts up to 85 per cent of salt water into fresh water, leaving the remaining water as concentrated brine.
Oddonetto 称，反渗透技术的主要缺点是水回收率有限，最多只能把 85% 的盐水转化为淡水，剩下的水则为浓盐水。

This leftover brine is typically injected underground via a process called deep-well injection. But deep-well injection has consequences, such as environmental risks and the waste of valuable metals and minerals, including lithium which is used in the development of phones, laptops and electric vehicles.

这些剩余的浓盐水通常通过一种叫深井注水的工艺注入地下。但深井注水会产生后患，如，环境风险，浪费宝贵的金属和矿物质，包括用于制造手机、笔记本电脑和电动汽车的锂。

How does salt-free electrodialysis metathesis work?
无盐电渗析合成法是如何进行的?

Salt-free electrodialysis metathesis treats brine by passing it through ion exchange membranes, thin sheets or films, and electrical currents that work to separate salt from water at the molecular level.
无盐电渗析合成法通过离子交换膜、薄片或薄膜以及电流处理盐水，在分子水平上分离盐和水。

In early testing, over 90 per cent of salt water was converted to fresh water after going through reverse osmosis and salt-free electrodialysis metathesis in succession. In addition, Oddonetto said the technique generated higher levels of valuable metals and minerals that can be repurposed across several industries including technology, health and food.
在早期测试中，通过反渗透和无盐电渗析合成后，超过 90% 的盐水被转化为淡水。此外，Oddonetto 表示，该技术还能产生更多有价值的金属和矿物质，这些金属和矿物质可在多个行业，包括技术、健康和食品中重新利用。

Ivonne Santiago, an associate professor in the Department of Civil Engineering at UTEP and Oddonetto's doctoral advisor told media: "In the next few years, I anticipate that we will see Tayia's research applied on a large scale and fully see the tremendous benefit her work can have on humankind. Her journey is a testament to her perseverance, the importance of working on challenging problems and the value of a strong work ethic and positive attitude."
UTEP 土木工程系副教授，Oddonetto 的博士生导师 Ivonne Santiago 告诉媒体：“未来几年，我预计我们将看到 Tayia 的研究会得到大规模应用，并能看到她的工作能为人类带来的巨大利益。她的经历证明了她的毅力，研究挑战性问题的重要性，强烈的职业道德和积极态度的价值。”

Next steps
未来打算

Oddonetto research continues through multiple live experiments run in collaboration with the National Alliance for Water Innovation (NAWI), El Paso Water, the Kay Bailey Hutchison Desalination plant, New Mexico State University and the U.S. Bureau of Reclamation. These experiments will hlp to refine the salt-free electrodialysis metathesis process further and provide more insight as to the mechanisms that can be used to make the approach more cost-efficient and easily applicable on a large scale.
通过与国家水创新联盟 (NAWI)、埃尔帕索水务公司、凯贝利哈奇森海水淡化厂、新墨西哥州立大学和美国垦务局合作开展多项现场实验，Oddonetto 的研究仍在继续。这些实验将有助于进一步完善无盐电渗析合成工艺，并提供更多有关机制的见解，使该方法更具成本效益，更易于大规模应用。

SPACE TECH DIGITISES WATER RESILIENCE IN BASINS
跨界合作：借助空间技术重塑水资源韧性与安全

An initiative between CEO Water Mandate and the European Space Agency (ESA) is combining digital and space technologies to improve data collection and increase understanding of freshwater resources, including water stress, quality, and accessibility.
CEO Water Mandate 与欧洲航天局(ESA)开展了合作项目，致力于将数字技术与空间技术相结合，以提升水资源数据收集效率，并加深对淡水资源的理解，如，水资源压力、水质及供水等问题。

A cutting-edge digital monitoring platform
先进的数字监控平台

The partnership aims to leverage space technologies and innovative digital tools for advancing water security and resilience by offering comprehensive monitoring of global water resources, such as basins, and adding significantly to the data available.
这项合作旨在通过太空技术和创新数字工具对全球水资源（如流域）进行全面监测，从而提升水资源的安全性和韧性，并大幅增加可用数据量。

Writing on LinkedIn, ESA's Davide Coppola, explained more: "I am delighted to see the initial outcomes of this initiative, confirming how space technologies, combined with digital tools and IoT, can illuminate water stress drivers and intervention impacts, even in the most remote regions. Our collaboration with the CEO Water Mandate and the Water Resilience Coalition unlocks new opportunities for cross-sectoral cooperation and innovative business models..."
ESA 的 Davide Coppola 在 LinkedIn 上进一步解释道："我很高兴看到项目的初步成果，证明了太空技术与数字工具和物联网结合后，即使在最偏远的地区，也能有效揭示水资源面临的压力和干预措施的影响。我们与 CEO Water Mandate 和 Water Resilience Coalition 的合作为跨行业合作和创新商业模式创造了新的机遇。"

The initiative forms part of CEO Water Mandate's goal to achieve positive water impact in 100 priority basins by 2030. Its ambition is to develop a cutting-edge digital monitoring platform for these water-stressed basins, which will provide actionable insights into water basin conditions, helping businesses track their contributions to water resilience goals.
该项目是 CEO Water Mandate 为实现到 2030 年在 100 个重点流域产生积极水资源影响目标的一部分。其目的是为这些水资源紧张的流域创建一个先进的数字监测平台，提供对流域状况的实用见解，帮助企业追踪其在提高水资源韧性方面的贡献。

From COP28 to breakthrough results
从COP28到突破性成果

The partnership between CEO Water Mandate and the European Space Agency (ESA) announced the first cohort of projects during COP28 in 2023. This marked what the partnership called 'a transformative step in utilising space technologies, digital innovation, and IoT to enhance water basin monitoring'.
在 2023 年第二十八届联合国气候变化大会(COP28)期间，CEO Water Mandate 与 ESA 宣布了首批合作项目，标志着双方在"利用空间技术、数字创新和物联网提升水域监测方面迈出了重要的转型步伐"。

Since that time, the projects have proved valuable in producing quality data, including:
这些项目已经证明，在生成高质量数据方面具有重要价值，包括：

- Comprehensive data sets tracking changes in water levels over time and into the future.
- 提供全面的水位变化数据集。

- Detailed water quality measurements and pollution source identification.
- 详细的水质监测和污染源识别。

- Climate impact modelling to predict future basin conditions.
- 气候影响建模，用于预测未来水域的变化情况。

It has also achieved several milestones, including:
该项目取得了多项重要成果，包括：

- Funding: ESA allocated €1.5 million to fund eight feasibility studies using satellite data and digital monitoring tools to create detailed diagnostics and impact assessments for selected basins.
- 资金：ESA 拨款 150 万欧元资助八项使用卫星数据和数字监测工具的可行性研究，以创建选定流域的详细诊断和影响评估。

- Global reach: projects span 13 countries, including Colombia, India, Kenya, Morocco, and the US, setting the stage to expand to 100 priority basins.
- 全球覆盖：项目遍及 13 个国家，包括哥伦比亚、印度、肯尼亚、摩洛哥和美国，为未来扩展到 100 个重点流域奠定了基础。

- Corporate engagement: CEO Water Mandate member companies actively contributed to pilot projects, aligning efforts with Net Positive Water Impact (NPWI) monitoring goals.
- 企业参与：CEO Water Mandate 成员公司积极参与试点项目，推动与 Net Positive Water Impact

(NPWI)监测目标的对接。

• Pilot partners: eight European companies - Agreed Earth, CLS, Development Seed, eLeaf-52impact, EOMAP, eRay, Krucial, and Marple - participated in pilot projects, showcasing scalable solutions.
• 试点合作：包括 Agreed Earth、CLS、Development Seed、eLeaf-52impact、EOMAP、eRay、Krucial 和 Marple 在内的八家欧洲公司参与了试点项目，展示了可扩展的解决方案。

• Future development: there are plans for expanded corporate support and additional projects.
• 未来发展：计划吸引更多企业投资，并启动更多相关项目。

Jason Morrison, head of the CEO Water Mandate and president of the Pacific Institute, highlighted the importance of space technology in water management: "This partnership with ESA is revolutionising access to water-related data. By integrating satellite observations with innovative technologies, we are opening new frontiers in understanding and protecting freshwater resources worldwide."
CEO Water Mandate 负责人兼太平洋研究所所长 Jason Morrison 强调了空间技术在水资源管理中的关键作用："与 ESA 的合作正在改变我们获取水资源数据的方式。通过卫星观测与创新技术相结合，我们正在开辟一个全新领域，以更好地理解和保护全球地淡水资源。"

Space tech already making waves in the water sector
空间技术在水务领域已经显现成效

The ESA has invested in companies and products working in many sectors to provide robust data collected via satellite monitoring technologies. Among those sectors, many rely on accurate and reliable water data.
ESA 已投资多个领域的公司和产品，利用卫星监测技术收集可靠的数据。在这其中的众多行业都依赖于准确可靠的水资源数据。

For example, project THIRTSY used satellite-based thermal data developed by Hydrosat to offer crop yield forecasts in order to improve supply chain management. A second tool will promote farm, and water, management, by informing farmers of the best times to irrigate. Optimal irrigation leads to increased production while reducing water consumption.
例如，THIRTSY 项目使用 Hydrosat 开发的基于卫星的热成像数据，支持作物产量预测，以帮助优化供应链管理。另一个工具则通过告知农民最佳灌溉时机来促进农业和水资源管理，最佳灌溉不仅能提高产量，还能减少用水量。

THIRSTY was able to overcome customers challenges, such as inaccurate data, insufficient geographical coverage, and predictions that arrive too late in the growing season to be operationally useful, by providing accurate, early season forecasts in major European commodity producing countries.
THIRSTY 项目通过提供准确的早期季节预测，成功解决了客户面临的一些挑战，如，数据不准确、地理覆盖不足以及预测结果过晚，导致无法及时采取有效措施等，该项目主要面向欧洲主要农产品生产国。

Yield forecast and irrigation management primarily use publicly available satellite data and weather data, alongside Hydrosat's proprietary data.
产量预测和灌溉管理主要依赖于公开的卫星数据和天气数据，同时结合了 Hydrosat 的专有数据。

Thermal infrared imagery can reveal precise canopy temperatures, which gives a measure of evapotranspiration and photosynthetic activity in leaves. This reveals any water stress well before any damage becomes visible.
热红外影像能够精确揭示树冠温度，从而衡量植物蒸散作用和叶片光合作用活性。这能在任何损害变得可见之前揭示水资源压力。

Other projects have looked at coastal areas to measure water levels, soil erosion and flooding, among other things to help predict future flooding risks and other water-related scenarios. This can predict the future position of the coastline and improve planning to mitigate such events. This project, CORISCLIM, uses four different satellite systems:
其他项目则专注于沿海地区，监测水位、土壤侵蚀和洪水等，旨在帮助预测未来洪水风险和其他水资源相关问题。这些项目不仅能够预测未来海岸线的变化，还能改进规划，以减少此类事件的影响。CORISCLIM 项目便就是一个典型例子，它使用了四种不同的卫星系统：

• Radar altimetry: for the dynamics of the oceans (change in sea level, waves, storm surges, tides).
• 雷达测高：用于监测海洋动态（如，海平面变化、波浪、风暴潮和潮汐）。

• Optical imagery: for the coastal shoreline and erosion.
• 光学图像：用于监测海岸线和侵蚀情况。

• Radar imagery: for the terrestrial digital elevation model.
• 雷达影像：用于生成地面数字高程模型。

• Telemetry & GNSS: for vertical land motion.
• 遥测和全球导航卫星系统（GNSS）：用于监测陆地的垂直运动。

REEDS BEDS OFFER SUSTAINABLE SLUDGE TREATMENT
芦苇床提供可持续的污泥处理

Reed beds have significant potential as a treatment and management process for sludge derived from wastewater, according to a study by researchers from Sultan Qaboos University.
根据苏丹卡布斯大学研究人员的一项研究，芦苇床在污水污泥处理和管理过程中具有重要潜力。

Sustainable methods for treating wastewater sludge
可持续的污水污泥处理方法

Residual sludge, leftover from wastewater treatment, contains high levels of nutrients and chemicals that are hazardous and pose both environmental and health risks if they are not treated and managed properly.
来自污水处理的残余污泥含有高浓度的营养物质和化学物质，如果不进行适当处置和管理，可能对环境和健康造成危害。

With traditional methods coming under scrutiny for their energy-intensive, chemically-driven, poor sustainability credentials, researchers are turning their attention to alternative treatments, such as those provided by nature-based solutions.
随着传统方法因其高能耗、化学驱动和可持续性差而受到质疑，研究人员将目光转向自然基础的替代处理方法。

The team from Sultan Qaboos University turned their attention to reed beds in a series of trials to test their ability to both stabilise the sludge and break down any pollutants. The results of their findings were published in Soil and Environmental Health.
苏丹卡布斯大学的团队在一系列试验中将注意力转向了芦苇床，以测试其稳定污泥和降解污染物的能力。他们的研究结果发表在《Soil and Environmental Health》期刊上。

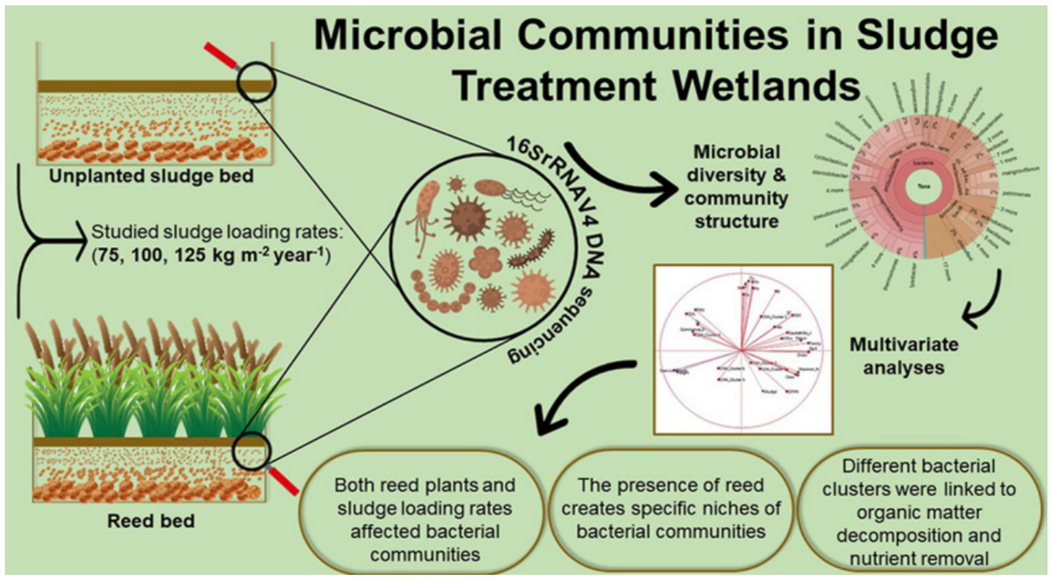
Testing with three sludge loading rates
在三种污泥负荷率下进行测试

Sludge-treatment reed beds (STRBs) are widely recognised as a cost-effective, highly efficient, and environmentally friendly solution for sludge treatment and dewatering.
污泥处理芦苇床（STRB）被广泛认为是污泥处理和脱水的经济高效、环保的解决方案。

In this study, the researchers evaluated the performance of reed beds under three different sludge loading rates: 75, 100, and 125 kg/m²/year. Previous studies demonstrated that reeds beds are excellent at breaking down pollutants. The current research focused on microbial diversity, sludge decomposition efficiency, and overall treatment effectiveness, based on the different rates of loading.
在这项研究中，研究人员评估了在三种不同污泥负荷率下芦苇床的性能：75、100 和 125 kg/m²· 年。先前就有研究表明芦苇床在降解污染物方面表现出色，因此本研究则集中于基于不同的负荷率下的微生物多样性、污泥分解效率和整体处理效果。

In total, the trial consisted of 18 beds filled with substrate media arranged in the following order: 15 cm of fine gravel (2-6 mm), 15 cm of medium gravel (15-25 mm), and a 5 cm drainage layer of cobbles (40-60 mm). The physical characteristics of the beds differed slightly, with a control bed containing only substrate. Nine of the beds featured reeds (Phragmites australis), while the remained contained no reeds.
试验共由 18 个填充基质的床组成，排列顺序为：15 厘米的细砾石（2-6 毫米）、15 厘米的中砾石（15-25 毫米）和 5 厘米的卵石排水层（40-60 毫米）。这些床的物理特性略有不同，控制床仅包含基质。九个床含有芦苇（Phragmites australis），其余则不含芦苇。

The team used 16S rRNA sequencing techniques to identify key microbial species responsible for nutrient removal and organic matter stabilisation.
研究团队使用 16S rRNA 测序技术识别出了负责营养物质去除和有机物稳定化的关键微生物种类。



Why do reeds have such potential for sludge treatment?
为什么芦苇在污泥处理方面具有如此潜力?

The structure of reeds provides niche habitats that promote the growth of specific species of microbes, while excluding others. The plants also promote higher oxygen levels, in which aerobic bacteria thrive. The metabolic capabilities and preferences of these bacteria help to accelerate a decrease in organic loads, compared to the control beds, which had less oxygen available.
芦苇的结构提供了有利于特定微生物种类生长的栖息地，同时排除了其他种类。这些植物还促进了更高的氧气水平，使好氧细菌得以繁殖。相较于氧气较少的控制床，这些细菌的代谢能力和特性有助于加速有机负荷的减少。

The researchers found that proteobacteria emerged as the dominant microbial group. These helped to drive critical carbon and nitrogen cycles in the reed beds.
研究人员发现，变形菌门(Proteobacteria)是主要的微生物群体，这些微生物在芦苇床中驱动了关键的碳和氮循环。

Dense root systems also represent a natural filtration system and when combined with the above properties, reeds are particularly efficient at pollutant removal and decomposition of organic matter, such as nutrients and suspended solids.
密集的根系也代表了一种自然过滤系统，结合上述特性，芦苇在去除污染物和分解有机物(如营养物质和悬浮固体)方面特别高效。

Conclusions and areas for future research
结论和未来研究领域

The researchers concluded that sludge treatment reed beds (STRB) offer a sustainable and environmentally friendly approach to sludge management. Not only are they easily scalable, but they also negate the need for chemically-driven, energy-intensive processes.
研究人员得出结论，污泥处理芦苇床(STRB)提供了一种可持续和环保的污泥管理方法。它们不仅易于扩展，还消除了对化学驱动和高能耗过程的需求。

The STRBs achieved up to a 98 per cent reduction in sludge volume, with optimal performance observed at a loading rate of 100 kg/m²/year.
STRB 在污泥体积上减少了高达 98%，在负荷率为 100 kg/m²/ 年时表现最佳。

The report stated: "Future research can build upon these findings to explore novel approaches for enhancing pollutant removal and ecosystem services in sludge treatment systems, ultimately advancing sludge management and environmental preservation efforts."
报告指出："未来的研究可以在这些发现的基础上探索新方法，以增强污泥处理系统中的污染物去除和生态系统服务，最终推动污泥管理和环境保护工作。"

It suggested five areas for future research:
建议以下五个未来研究领域：

- Exploration of different plant species in similar systems
- 探索类似系统中不同植物种类

- Testing extreme sludge rates
- 测试极端污泥负荷率

- Exploring the role of fungi in STRB
- 探索真菌在 STRB 中的作用

- Exploring greenhouse gas emission responses and other sustainability aspects
- 探索温室气体排放反应及其他可持续性方面

- Researching the economic viability of STRB under different scenarios.
- 研究不同情境下 STRB 的经济可行性

PHOTOCHEMICAL OXIDATION COULD CREATE SUSTAINABLE ENERGY FROM WATER
创新与可持续：光化学氧化技术

Researchers from the Institute of Science, Tokyo, believe water has the potential to provide future sustainable energy sources through a process of photochemical oxidation, a process that uses light to split water molecules.
东京科学研究所的研究人员认为，水有潜力通过光化学氧化过程来提供未来的可持续能源，而这一过程利用光来分解水分子。

Splitting water to produce clean hydrogen
通过分解水来生产清洁氢气

The study builds on previous research at the Institute of Tokyo, Japan, that has explored using different catalysts and conditions to split water into its component oxygen and hydrogen parts using sunlight. Different catalysts have been trialled producing a wide variety of results, and while each study suggested the method had potential to produce clean hydrogen, the catalysts used had resulted in drawbacks.
在东京科学研究所之前的研究基础上，该研究探讨了在不同催化剂和条件下利用阳光将水分解成氧和氢。不同的催化剂经过试验，产生了不同的结果，尽管每项研究都表明该方法有潜力生成清洁氢气，但所使用的催化剂一直存在着缺点。

Researchers at the Institute of Science, Tokyo, have, therefore, been looking at ways to improve the efficiency of the catalytic materials.
因此，东京科学研究所的研究人员一直在寻找提高催化材料效率的方法。

Improving the efficiency of water oxidation
提高水氧化的效率

Water oxidation holds enormous potential to produce sustainable energy, but the catalytic activity and catalysts behind the reaction are not fully understood. The researchers, led by assistant professor Megumi Okazaki, have been actively investigating the factors that drive this process, with their latest breakthrough study published in the journal Chem Catalysis.
水氧化具有产生可持续能源的巨大潜力，但目前对反应背后的催化活性和催化剂尚未完全了解。由助理教授 Megumi Okazaki 领导的研究团队一直在积极研究推动这一进程，他们最新的突破性研究已发表在《化学催化》期刊上。

Photochemical water oxidation is a process that involves using light to split water molecules, releasing oxygen in the process. The team has been working improving the efficiency of the process, which could advance its ability to provide renewable energy solutions.
光化学水氧化是一个利用光分解水分子并释放氧气的过程。该团队一直致力于提高这一过程的效率，因为这可能会提高其提供可再生能源解决方案的能力。

The team focused on role of Ru(II) photosensitizers, metal oxide (MOx) catalysts, and pH conditions.
该团队专注于 Ru(II) 光敏剂、金属氧化物（MOx）催化剂和 pH 条件对光化学水氧化的影响。

Unlocking water's energy potential
释放水中的能源潜力

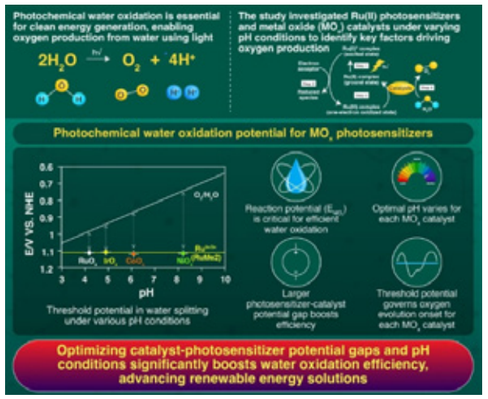
To understand more about the process, the research team investigated the performance of Ru(II) photosensitizers when paired with various MOx catalysts under different pH conditions.
为了更深入了解这一过程，研究团队调查了在不同 pH 条件下 Ru(II) 光敏剂与各种 MOx 催化剂配对时的性能。

They employed a novel approach to estimate the reaction potential (EMOx) of the catalysts without requiring complex electrochemical setups. Instead, data analysis was used to identify the thresholds at which oxygen evolution began, and to evaluate how the potential gap between the photosensitizer and catalyst influenced the efficiency.
他们采用了一种创新方法来估算催化剂的反应电位（EMOx），不需要复杂的电化学设备——利用数据分析来识别氧气释放开始的阈值，并评估光敏剂与催化剂之间的潜在差距如何影响效率。

Several factors were found to influence the efficiency of the water oxidation process.
最终，研究发现了几个影响水氧化过程效率的因素。

Okazaki told media: "Reaction potential (EMOx) plays a critical role in the water oxidation process, directly visualizing the driving force towards water oxidation that have never measured by any apparatus under reaction condition."
Okazaki 在媒体上表示："反应电位（EMOx）在水氧化过程中起着关键作用，它直接可视化了水氧化的驱动力，这是任何仪器在反应条件下都无法测量到的。"

Onset pH conditions vary across different MOx catalysts. This determines whether the water oxidation takes places, highlighting the importance of tailoring reaction environments for each catalyst.
不同 MOx 催化剂的起始 pH 条件也是不同的，这决定了水氧化是否发生，也显示了为每种催化剂定制反应环境的重要性。



Moving towards real-world potential
朝着成功迈进

The researchers are confident that the study confirmed that 'fine-tuning reaction potential and pH conditions can significantly enhance the efficiency of water oxidation'. Identifying optimal conditions for each catalyst provides a strategic framework for designing more effective systems.
研究人员对这项研究的结果充满信心，他们证实了"微调反应电位和 pH 条件可以显著提高水氧化的效率"。确定每种催化剂的最佳条件为设计更有效的系统提供了战略框架。

Okazaki explained: "By developing a simplified method to estimate reaction potentials, we are making this research more accessible and cost-effective. This innovation could revolutionise the way we design and select catalysts, accelerating progress toward more efficient and sustainable energy solutions."
Okazaki 解释道："我们通过开发一种简化的方法来估算反应电位，使得这项研究更加可及且具成本效益。这一创新可能会彻底改变我们设计和选择催化剂的方式，并加速向更高效、更可持续的能源解决方案迈进。"

By exploring the interplay between catalysts, photosensitizers, and pH, the researchers believe the study lays the foundation for more efficient water oxidation systems. The potential for such a process is that it makes novel and practical solutions for solving the world's current energy problems and points the way forward for clean and sustainable energy generation.
通过探讨催化剂、光敏剂和 pH 之间的相互作用，研究人员相信这项研究为更高效的水氧化系统奠定了基础。这一过程的潜力在于它为解决当前全球能源问题提供了创新和实用的方案，并指明了清洁可持续能源的未来发展方向

The potential for incorporating an energy generating system into water generation or treatment footprints may be some way off, but studies such as these provide an insight into what is possible in the water-energy nexus.
将能源生成系统融入水的生产或处理过程的潜力可能仍需时日，但此类研究为水与能源的结合提供了宝贵的洞见。

PIPE CLEANING SOLUTION IS TACKLING BRAZIL'S COMPLEX SEWER NETWORK
巴西管道清洗新突破

Dutch-based inspection and data solutions provider Acquaint is working with Brazilian pipe cleaning company 4Pipe-Hidropig to tackle a number of challenges in the South American country's complex sewer pipeline network.
总部位于荷兰的检测和数据解决方案提供商 Acquaint 正在与巴西管道清洗公司 4Pipe-Hidropig 合作，一起解决南美国家的复杂排水管网中的众多问题。

The Brazilian pipeline challenge
巴西的管道挑战

While many countries face multiple challenges in maintaining and upgrading their below ground sewer pipeline network, Brazil provides a particularly challenging scenario.
许多国家在维护和升级地下排水管网时面临多重挑战，其中巴西的情况尤其复杂。

Pipelines across the country are made of different materials, often with different internal diameters, subject to varying temperatures and pressures, and with no standard depth below the ground surface. The country is vast, with widely different environments and pipeline needs. This provides challenges in both infrastructure and logistics, which includes cleaning the pipes and finding reliable methods to check their condition. Even locating pipelines can be a challenge.
巴西的管道由多种材料制成，内部直径各不相同，受不同温度和压力的影响，且埋藏深度没有统一标准。由于巴西地域广阔，各地环境和管道需求差异显著，这给基础设施和物流带来了挑战，包括管道清洗和寻找可靠检测方法，甚至管道定位本身也可能是一项困难的任务。

Combining strengths to tackle multiple goals
结合优势，共同应对多重目标

Of course, these problems provide opportunities, and the combination of 4Pipe-Hidropig's local knowledge and Acquaint's global experience and expertise is helping to provide solutions to some of these challenges.
当然，这些问题也带来了机遇，4Pipe-Hidropig 的本地知识与 Acquaint 的全球经验和专业技术的结合正在帮助应对这些挑战。

Mateus Nobeschi, commercial manager of 4Pipe-Hidropig told media: "Within the Brazilian market, the need to gain insight into the condition of their pipelines is growing more than ever. Through our partnership, we can work purposefully and offer valuable solutions that truly help customers move forward."
4Pipe-Hidropig 的商业经理 Mateus Nobeschi 对媒体表示："在巴西市场，了解管道状况的需求比以往任何时候都更加迫切。通过我们的合作，我们能够有针对性地提供真正帮助客户向前发展的解决方案。"

Erik Driessen, CEO of Acquaint explained why the Brazilian market is full of potential: "The needs in Brazil are similar to those in Europe due to the ageing underground infrastructure, but the scale and context make it unique."
Acquaint 的首席执行官 Erik Driessen 则解释了巴西市场的独特潜力："由于地下基础设施的老化，巴西的需求与欧洲相似，但其规模和环境背景使其具有独特性。"

Cleaning tools combined with structure sensors
清洁工具结合结构传感器

4Pipe-Hidropig provides pipe cleaning solutions to the Brazilian sewer market. It manufactures pipeline inspection gauges, or PIGs, that are used to clean pipes. The companies will be using a tool called the Acquarius, which is foam PIG, however, the version used by the companies is equipped with a variety of advanced ultrasonic sensors that emit and receive sound waves to detect potential anomalies (such as corrosion, leaching, H2S damage, and leaks) in the walls or joints of the pipeline.
4Pipe-Hidropig 为巴西的排水市场提供管道清洗解决方案，主要通过制造管道检查器（即 PIGs）来实现清洗功能。两家公司将使用一种名为 Acquarius 的工具，这一工具配备了各种先进的超声波传感器，能够发射和接收声波，从而检测管道壁或接头处的潜在异常（如腐蚀、浸出、H2S 损害和泄漏）。

Further logistical challenges will be tackled by other sensors that can detect the exact location of the pipeline.
此外，其他传感器还将有助于解决物流挑战，精确定位管道。

Early success in steel water pipeline
钢质水管道的早期成功

Early projects have proved successfully with a one project completed for the Anglo-American mining company, which has a mining site near Belo Horizonte in the Minas Gerais region of Brazil.

早期项目取得了显著成功，其中一个项目为 Anglo-American 矿业公司完成，该公司的矿区位于巴西米纳斯吉拉斯州 Belo Horizonte 附近。

The project included the cleaning and inspection of a 21-kilometre long, steer water pipeline with a 30-inch diameter. The pipe takes water from Rio de Peixe to the mining site just outside of Belo Horizonte, the sixth largest city in Brazil.
该项目涉及对一条长 21 公里、直径 30 英寸的钢质水管道进行清洗和检查，管道负责将水从 Rio de Peixe 输送到 Belo Horizonte 附近的矿区，后者是巴西第六大城市。

To prepare for the inspection and to restore the pipe's full flow capacity for the client, 4Pipe-Hidropig carried out a major cleaning operation which removed sediment and corrosion from the length of the pipeline.
为准备检查并恢复管道的全流量，4Pipe-Hidropig 进行了大规模的清洗行动，彻底清除管道中的沉积物和腐蚀。

For this project, Acquaint supplied the latest version of its Acquarius tool, which was launched and tracked by the 4Pipe-Hidropig team onsite.
在该项目中，Acquaint 提供了其最新版本的 Acquarius 工具，并由 4Pipe-Hidropig 团队在现场进行监测。

Collaboration has a bright future
合作前景光明

The successful start to the collaboration between the two companies ensures it is not a one-off project and that the long-term alliance will focus on innovation and growth. For now, the focus will be on Brazil before moving to the surrounding areas, each of which will provide their own challenges.
两家公司成功的初步合作确保了这不是一次性项目，而是长期的联盟，之后并将专注于创新和发展。目前，工作的重点将放在巴西，随后有计划扩展到周边地区，但是每个地区都将面临各自的挑战。

Driessen added: "We believe this partnership not only strengthens the position of both companies but also makes a valuable contribution to improving Brazil's underground infrastructure."
Driessen 补充说："我们相信，这一合作不仅会增强两家公司的实力，还将为改善巴西的地下基础设施做出重要贡献。"

Not only is 4Pipe-Hidropig continuing to inspect and clean client pipelines using the Acquaint tool, one of the next goal's is to begin local production of the PIGs essential for the Aquarius inspection technology.
目前，4Pipe-Hidropig 会持续使用 Acquaint 的工具对客户的管道进行检查和清洗，其下一步的目标之一是开始在当地生产对 Aquarius 检查技术至关重要的 PIG。

Nobeschi concluded: "Together with Acquaint, we can better support our clients and contribute to a sustainable future for the water and sewage sector in Brazil."
Nobeschi 总结道："与 Acquaint 的合作使我们能够更好地支持客户，为巴西供水和污水部门的可持续未来做出贡献。"

MUNICIPAL EFFLUENT REUSE SET FOR HEART OF CHEMICAL PLANT
可持续发展先锋：化工厂市政废水再利用

One of the world's largest applications of industrial water reuse from municipal effluence is set to be at the heart of low-carbon chemical production in Mexico after a Memorandum of Understanding (MoU) was signed between Transition Industries LLC and Veolia Water Technologies & Solutions.
全球最大的市政废水工业水再利用项目之一，即将在墨西哥低碳化学品生产的核心落地。在此之前，Transition Industries LLC 与 Veolia Water Technologies & Solutions 签署了一份谅解备忘录(MoU)，旨在促进水资源的再利用。

MoU will help shape water reuse at expansive chemical plant
MoU将帮助推进大规模化工厂的水资源再利用

The agreement would provide advanced industrial water technology to the Pacifico Mexinol project, in Topolobampo, Sinaloa, northwestern Mexico, which is expected to commence operations in 2028.
该协议将为位于墨西哥西北部锡那罗亚州 Topolobampo 的 Pacifico Mexinol 项目提供先进的工业水技术，预计该项目将在 2028 年开始运营。

The plant will be one of the world' s largest standalone ultra-low carbon chemical production facilities, with an expected output of 6,145 metric tons of methanol (MT) per day. While the plant will be built and operated by Transition Industries, a developer of world-scale, net-zero carbon emissions methanol and hydrogen projects, the MoU will see Veolia develop a 'purpose-driven water strategy' that has been designed with Ahome Municipality's Drinking Water and Sewage Board (JAPAMA).
该工厂将成为全球最大的独立超低碳化学品生产设施之一，预计每日产出 6,145 公吨甲醇（MT），Transition Industries 负责该工厂的建设和运营——这是一家致力于开发零碳排放甲醇和氢气项目的公司。MoU(谅解备忘录)将促使 Veolia 与 Ahome 市供

水和污水委员会（JAPAMA）共同制定"以目标为导向的水资源战略"。

Tackling water scarcity issues 'head-on'
直面水资源短缺问题

The Pacifico Mexinol project's water management approach tackles water scarcity head-on by using a closed-loop system to capture, treat and reuse municipal wastewater onsite. Not only will this avoid the need to extract from local freshwater sources, preserving these resources for local community needs, such as farming, one of its mission priorities is to prevent effluent reaching the Bay of Ohuira; the reuse facility will prevent an estimated 8.5 million cubic meters of wastewater from being discharged into the bay each year, helping to reduce the plant's environmental impact.
Pacifico Mexinol 项目采用闭环系统在现场捕集、处理和再利用市政废水，直接应对水资源短缺问题。这种方法不仅避免了从当地淡水资源中提取水，保护了这些资源以满足社区需求，如农业，同时也旨在防止污水进入 Ohuira 湾。该再利用设施预计每年将防止约 850 万立方米的污水排入海湾，从而有效减少工厂的环境影响。

Balmore Brito, Pacifico-Mexinol project director and head of engineering and technology for Transition Industries, told media: "Years of community and municipal engagement has led to the development of a set of purpose-driven design solutions, like our wastewater strategy."
Pacifico Mexinol 项目主任及 Transition Industries 工程与技术负责人 Balmore Brito 对媒体表示："多年来，我们与社区和市政的互动促成了一系列以目标为导向的设计解决方案的开发，例如我们的污水策略。"

He added: "The ability to partner with Veolia, a global leader in water solutions, to leverage technology and minimize negative environmental impacts, is foundational to our core values of combating climate change and leading in environmental and social responsibility."
他补充道："与水解决方案全球领先者 Veolia 的合作，使我们能够利用先进技术，尽量减少负面环境影响，这与我们应对气候变化、引领环境和社会责任的核心价值观高度契合。"

AQUA TECHNOLOGY

The water treatment tech behind the agreement
协议背后的水处理技术

Veolia will design and equip the water treatment facility based on designs created with the local municipality' s sewage and drinking water board and be responsible for operational optimisation. The facility will use advanced technologies such as ZeeWeed 500D™ ultrafiltration membranes, PROflex™ reverse osmosis membranes and E-Cell™ electro deionization.
Veolia 将根据当地市政的污水和供水委员会的设计，负责设计和装备水处理设施，并进行运营优化。该设施将采用先进技术，包括 ZeeWeed 500D™超滤膜、PROflex™反渗透膜和 E-Cell™电去离子设备。

Anne Le Guennec, senior executive VP for Worldwide Water Technologies at Veolia, told media: "We are very proud to partner with Transition Industries on this transformative project. Our best-in-class water technologies and regeneration processes will enable sustainable methanol production, contributing to the acceleration of decarbonization and reduction of greenhouse gas emissions, in full alignment with our GreenUP strategic program commitments."
Veolia 全球水处理技术高级执行副总裁 Anne Le Guennec 对媒体表示："我们非常自豪能与 Transition Industries 合作开展这一变革性项目。我们的顶尖水处理技术和再生工艺将支持可持续甲醇生产，助力加速减碳和减少温室气体排放，这与我们 GreenUP 战略计划的承诺高度一致。"

Sustainable methanol production at scale
大规模可持续甲醇生产

Transition Industries is developing the Pacifico Mexinol plant with the International Finance Corporation (IFC), a member of the World Bank Group. When it begins operations in 2028, the Pacifico Mexinol plant is expected to be the largest single ultra-low carbon methanol facility in the world. Its expected production rates are approximately 350,000 MT of green methanol and 1.8 million MT of blue methanol annually, from natural gas with carbon capture.
Transition Industries 正在与世界银行集团成员国际金融公司（IFC）共同开发 Pacifico Mexinol 工厂。预计该工厂将在 2028 年投入运营，届时将成为全球最大的单一超低碳甲醇设施，预计年产绿色甲醇约 35 万吨和蓝色甲醇 180 万吨，均来源于天然气及其碳捕获。

Methanol is used as a basic component in many products used everyday around the world, in homes, schools and businesses. These include LCD screens, paints, carpets, plastics, clothing, masks, and more.
甲醇作为许多日常产品的基本成分，广泛应用于全球的家庭、学校和企业中。这些产品包括 LCD 屏幕、油漆、地毯、塑料、服装和口罩等。

企业名称 COMPANY NAME	深圳市迈力威环保科技有限公司 Shenzhen Mailiwei Environmental Protection Technology Co.,Ltd.
联系人姓名 CONTACT NAME	MARIA
联系手机 CONTACT CELL PHONE	+86 138-7597-8466
联系邮箱 CONTACT EMAIL	gfpure@gfwater.ntesmail.com
企业网址 COMPANY WEB	www.gfpure.com

企业介绍
COMPANY PROFILE

GFpure 是一家专注于膜分离技术、CEDI(连续电去离子)技术、CEDI 离子交换膜技术研发、生产、制造、销售、服务为一体化的国家级高新技术型企业。GFPURE 技术团队拥有超过 20 年的膜分离技术经验、离子交换树脂处理及应用经验。公司已通过 ISO9001/ISO14001/ISO45001 三个管理体系认证，同时具备环境工程设计和施工资质，且产品也通过了 CE 认证。公司长期从事 UF 系统、RO 系统、超纯水系统、CEDI 膜块等多项水处理技术研究，并拥有多项水处理技术专利。凭借专业的技术、完整的设备、高品质的材料、完善的管理，可为全球客户提供高效、节能、环保的水处理系统整体解决方案。

企业介绍
COMPANY PROFILE

GFpure is a national high-tech enterprise focusing on the research and development, production, manufacturing, sales and service of membrane separation technology, CEDI (continuous electrodeionization) technology, and CEDI ion exchange membrane technology. The GFPURE technical team has more than 20 years of experience in membrane separation technology, ion exchange resin treatment and application experience. The company has passed the ISO9001/ISO14001/ISO45001 three management system certifications, and also has environmental engineering design and construction qualifications, and its products have also passed CE certification. The company has long been engaged in the research of UF systems, RO systems, ultrapure water systems, CEDI module and other water treatment technologies, and has a number of water treatment technology patents. With professional technology, complete equipment, high-quality materials and perfect management, it can provide global customers with efficient, energy-saving and environmentally friendly water treatment system overall solutions.

Product Description
产品介绍

DF 系列
DF series

DF系列CEDI膜块特点
DF series CEDI module features

* CPVC制作流道板框，高耐候性，长寿命设计
CPVC production of runner plate frame,high weather resistance,long life design

* 二次注胶双O型圈密封技术，杜绝泄露
Secondary glue injection to double O-ring sealing technology,prevent leakage

* 2进2出设计，可直接替换传统普通流道产品
2 in 2 out design,which can directly replace traditional ordinary flow channel products

* 特殊设计的离子交换膜，极高的离子选择性,可在有限体积内实现大流量制取高纯水
Specially designed ion exchange membrane,extremely high ion selectivity,can achieve a large flow in a limited volume to produce high purity water

产水流量 （flow rate）　　0.5-8 m^3/h

CF 系列
CF series

CF系列CEDI膜块特点
CF series CEDI module features

* CPVC制作流道板框，高耐候性，长寿命设计
CPVC production of runner plate frame,high weather resistance,long life design

* 可承受较大范围的进水电导率波动（不含CO2），相对同级产品具有更高的可靠性和运行经济性
It can withstand a wide range of inlet water conductivity fluctuations (excluding CO2), and has higher reliability and operating economy than similar products

* 独立的电极水排放技术，更安全，更可靠
Independent electrode water discharge design,safer and more reliable

* 专利的阶梯布水技术，极佳的单室交换速率
Patented stepped water distribution technology with excellent single chamber exchange rate

产水流量 （flow rate） 1-8 m^3/h

UPW半导体级
UPW series semiconductor

UPW-PRO系列CEDI膜块特点
UPW-PRO series CEDI module features

* 极高的体积交换容量，极低的运行能耗，极低的TOC析出
Extremely high volume exchange capacity,extremely low operating energy consumption,and extremely low TOC precipitation

* 为全球精密光学、微电子、半导体、高端实验室(超纯物质分析、痕量物质分析)等精密行业设计的 CEDI 产品
CEDI products designed for precision industries such as global precision optics, microelectronics, semiconductors, and high-end laboratories (ultra-pure material analysis, trace material analysis)

* 专利的阶梯布水技术，极佳的单室交换速率
Patented stepped water distribution technology with excellent single chamber exchange rate

产水流量 （flow rate） 1-5 m^3/h

UPW-B除硼

UPW-B boron removal

UPW-B系列CEDI膜块特点

UPW-B series CEDI module features

* 针对硅和硼脱除特殊设计的离子交换膜
Specially designed ion exchange membranes for silicon and boron removal

* 大幅提升后段精抛光系统使用寿命，降低系统运行成本
Greatly improve the service life of the finishing system,reduce system operating costs

* 硼脱除率高达98-99%
The boron removal rate is as high as 98-99%

* 阳极为铂金涂层，⩾10年寿命设计
The anode in coated with platinum and designed with a lifespan of ⩾10 years

产水流量 （flow rate） 1-5 m^3/h

HT高温系列

High temperature series

HT高温系列CEDI膜块特点

HT（high temperature) series CEDI module features

* 可承受大于150+次85℃（185℉）热水消毒
Can withstand more than 150+ times of 85℃ (185℉) hot water sterilization

* 特殊设计的高温离子交换膜，极高的离子选择性，最高连续运行温度可达60℃ （140℉）
Specially designed high temperature ion exchange membrane， extremely high ion selectivity，maximum continuous operating temperature up 60℃（140℉）

* 卫生级硅胶双密封技术，可耐受1.4-6.9bar(20-100psi)压力，杜绝泄露
Sanitary silicone double sealing technology, can withstand 1.4-6.9bar (20-100psi) pressure, and prevent leakage

* 水接触部分主体材质符合FDA要求
The main material of the water contact part meets FDA requirements

产水流量 （flow rate） 0.5-5 m^3/h

MAX大流量系列

Max large flow series

MAX大流量系列CEDI膜块特点

MAX large flow series CEDI module features

* 特殊设计的离子交换膜，高交换容量，高可靠性
Specially designed ion exchange membrane, high exchange capacity, high reliability

* 可承受多次化学清洗，高产水量设计
Can withstand multiple chemical cleanings, high water output design

* 特殊设计的流道板框，高耐候性，长寿命设计
Specially designed flow channel frame, high weather resistance, long life design

* 设计使用寿命达到80000小时以上
Designed service life of more than 80,000 hours

产水流量 （flow rate） 10-16 m^3/h

Case Showcase
案例展示

热电厂- 270吨 EDI 系统
EDI 电阻率 >17MΩ.cm
硅脱除率达到99%

Thermal power plant -270
T/H EDI system
EDI resistivity>17M Ω· cm
Silicon removal rate > 99%

化工行业- 600吨 EDI 系统
EDI 电阻率 >17MΩ.cm

Chemical industry -600
T/H EDI system
EDI resistivity>17M Ω· cm

企业名称 COMPANY NAME	潍坊恒远环保水处理设备有限公司 Weifang Hengyuan Environmental Water Treatment Equipment Co., Ltd.
联系人姓名 CONTACT NAME	孙海峰 Haifeng Sun
联系手机 CONTACT CELL PHONE	+86 159-6434-8851
联系邮箱 CONTACT EMAIL	hyzj@hyhbscl.com
企业网址 COMPANY WEB	https://www.hyhbwater.com/

企业介绍
COMPANY PROFILE

潍坊恒远环保水处理设备有限公司是一家集研发、生产、销售水处理设备、消毒设备于一体的生产型高新技术企业，主营污水处理设备、臭氧发生器、次氯酸钠发生器、净水设备等。公司拥有 40 余名专业人才组成的技术团队，具备环保工程专业承包二级资质、发明专利 10 项、外观专利 1 项、实用新型专利 39 项、软件著作权 6 项、涉水批件 27 项、消毒备案 8 项。公司通过 CE 认证、CCEP 环境保护产品认证、质量管理体系、环境管理体系、职业健康安全管理体系及五星级售后服务体系认证等多项权威认证。

恒远信达

企业介绍
COMPANY PROFILE

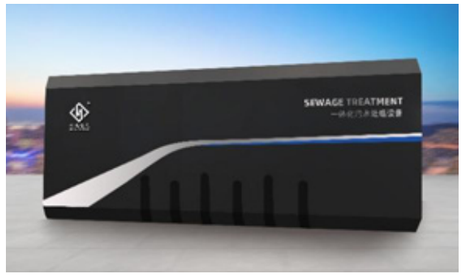
Weifang Hengyuan Environmental Water Treatment Equipment Co., Ltd. was founded in January 2011. We has own standardized workshop of more than 30,000M². Hengyuan is a production-oriented high-tech enterprise integrating R&D, production and sales of water treatment equipment, disinfection equipment and ecological toilets.Respect the original intention with integrity and make quality with craftsmanship. In line with the corporate purpose of "achieving success for customers externally and achieving success for employees internally", the company is committed to building a comprehensive water treatment solution service provider and empowering the environmental protection industry!

Product Description
产品介绍

一体化污水处理设备
Integrated sewage treatment equipment

Integrated sewage treatment equipment can effectively remove organic pollutants in water, equipment combined with water quality and quantity of comprehensive design, commonly used treatment processes include AO, MBR, MBBR,SBR,FMBR, anaerobic tower, Fenton, etc., effluent water quality is stable, easy to operate, high degree of automation,equipment can be customized according to customer needs appearance style, The equipment is widely used in domestic sewage, hospital sewage, new rural reconstruction sewage, aquaculture wastewater, slaughtering wastewater and various industrial wastewater.

一体化污水处理设备能有效去除水中的有机污染物，设备结合水质水量综合设计，常用的处理工艺包括AO、MBR、MBBR、SBR、FMBR、厌氧塔、芬顿等，出水水质稳定，操作简便，自动化程度高，设备可根据客户需求定制外观样式，该设备广泛应用于生活污水、医院污水、新农村改造污水、养殖废水、屠宰废水及各类工业废水。



气浮机

Dissolved air flotation machine

The high efficiency dissolved air flotation machine has a wide range of applications in the pre-treatment and in-depth treatment of the water treatment industry.The equipment adopts the suspension separation method to filter, intercept and purify the pollution factors in the wastewater. The equipment can use stainless steel slag scraper, nylon slag chain, and the excellent corrosion resistance treatment effect is stable. Can also be designed according to user needs, widely used in aquaculture wastewater,slaughter wastewater, printing and dyeing wastewater, food processing wastewater and industrial wastewater and other fields.

高效溶气气浮机在水处理行业的预处理和深度处理中有着广泛的应用。该设备采用悬浮分离法，对废水中的污染因子进行过滤、截留和净化。设备可选配不锈钢刮渣板、尼龙排渣链，耐腐蚀性能优良，处理效果稳定。也可根据用户需求进行设计，广泛应用于养殖废水、屠宰废水、印染废水、食品加工废水及工业废水等领域。

臭氧

Ozone Generator

Hengyuan ozone generator system is a high-quality product made by our company by applying the advanced ozone generating technology in the ozone industry at home and abroad and refining it with great care. The whole system is composed of gas source pre-treatment system, ozone generation system, ozone power supply system, central control system and ozone gas application system. At present, the ozone output of our single machine is 0.2-100kg/h, and the concentration of ozone export can reach 20-150mg/L. Compared with other large-scale ozone equipments in China, it has the features of compact structure, small surface area,stable ozone operation and low cost of use.

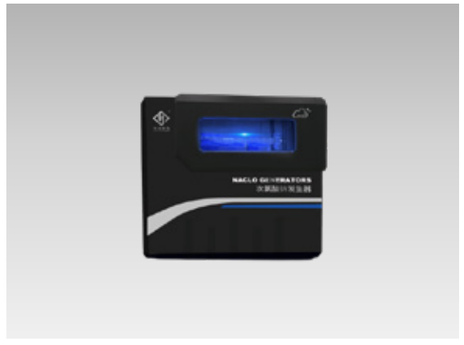
恒远臭氧发生器系统是我公司应用国内外臭氧行业先进的臭氧发生技术，精心打造的精品。整套系统由气源预处理系统、臭氧发生系统、臭氧电源系统、中央控制系统、臭氧气体应用系统组成。目前我公司单机臭氧产量为0.2-100kg/h，臭氧输出浓度可达20-150mg/L。与国内其他大型臭氧设备相比，具有结构紧凑、表面积小、臭氧运行稳定、使用成本低等特点。

次氯酸钠发生器

Sodium hypochlorite generator

Sodium hypochlorite generator through the principle of electrolytic salt preparation of sodium hypochlorite disinfectant, the equipment can achieve automatic operation, while equipped with multi-level hydrogen discharge system, suitable for all kinds of water disinfection, such as drinking water, recycling water and hospital sewage, domestic sewage and other water disinfection, can also be used to remove algae in water.

次氯酸钠发生器通过电解食盐的原理制备次氯酸钠消毒液，该设备可实现自动化运行，同时配备多级排氢系统，适用于各类水体的消毒，如饮用水、循环水及医院污水、生活污水等水体的消毒，也可用于去除水中的藻类

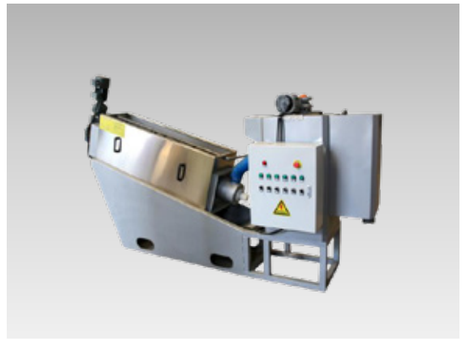



叠螺机

stacked screw sludge dewatering machine

Stacked screw machine, short for stacked screw sludge dewatering machine,is a kind of water treatment system widely used in municipal wastewater treatment projects as well as petrochemical, light industry, chemical fiber,papermaking, pharmaceutical, leather and other industrial industries. The actual operation situation proves that the stacked screw sludge dewatering can create considerable economic and social benefits for customers.

叠螺机，简称叠螺污泥脱水机，是一种广泛应用于市政污水处理工程以及石油化工、轻工、化纤、造纸、制药、皮革等工业行业的水处理系统。实际运行情况证明，叠螺污泥脱水能为客户创造可观的经济效益和社会效益

一体化净水设备

Integrated water purification equipment

All-in-one water purification equipment integrates seven main units: water distribution, mixing, flocculation, filtration, water collection, mud collection and automatic backwashing, which can effectively remove impurities, suspended solids, algae and microorganisms in the water, as well as odor and iron and manganese, which is equivalent to a water purification station with a full set of purification and treatment functions, and is also the first choice of the water treatment industry as an ideal and reliable water purification station.

一体式净水设备集布水、混合、絮凝、过滤、集水、集泥、自动反冲洗七大主要单元于一体，能有效去除水中的杂质、悬浮物、藻类和微生物，以及异味和铁锰等，相当于一个拥有全套净化处理功能的净水站，也是水处理行业首选的理想可靠的净水站

Case Showcase
案例展示

次氯酸钠发生器项目案例

Sodium hypochlorite generator project case:

The Qujing City Water Plant Project in Yunnan Province uses three 5000g sodium hypochlorite generators for which the company has obtained a patent for appearance, with a water treatment
capacity of 60,000m3/day, and a two-in-one standby operation mode.

污水处理项目案例

Sewage treatment project case:

Yuexi County Sewage Treatment Plant in Anhui Province, this project adopts MBR technology, and4 sets of integrated sewage treatment equipment are operated in series.

企业名称 COMPANY NAME	深圳市华瑗科技有限公司 ShenZhen HUAAI Technology Co., Ltd.
联系人姓名 CONTACT NAME	任总
联系手机 CONTACT CELL PHONE	189-2462-8577
联系邮箱 CONTACT EMAIL	huaaiisme@163.com
企业网址 COMPANY WEB	http://www.huaai-uvc.com

企业介绍
COMPANY PROFILE

深圳市华瑗科技有限公司成立于 2011 年，是一家以 UVCLED 产业链配套为核心的多元化发展公司。

公司的技术团队具有卓越的市场敏锐及研发能力，几年来申请专利多达 45 项，生产实践中为客户提供专业的技术配套及产品，配合国内家电厂家持续研发二十多款 UVC 杀菌模组，已经实现 KK 级批量生产；公司的 UVC 灯珠即有国内市场常规产品，也有车规级的无机封装产品，还有量产 WPE10-12% 的进口灯珠，为您的产品升级迭代保驾护航。

公司的宗旨是：精诚所至金石为开；我们的理念是：用 UVC 保护您的健康！

企业介绍
COMPANY PROFILE

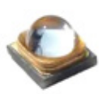
Shenzhen Huayuan Technology Co., Ltd. was established in 2011, which is a diversified development company with UVC LED industry chain supporting as the core.

The company's technical team has outstanding market sensitivity and R&D capabilities. Over the past few years, it has applied for more than 45 patents. In production practice, it provides professional technical support and products for customers. It has cooperated with domestic home appliance manufacturers to continuously develop more than 20 UVC sterilization modules, which have been mass-produced in KK series. The company's UVC LEDs have both domestic market conventional products and car-grade inorganic packaging products, as well as WPE10-12% imported LEDs for mass production. It will escort your product upgrade and iteration.

The company's purpose is: with sincere efforts, even stone will be opened; our concept is: protect your health with UVC!

Product Description
产品介绍

UVC杀菌灯珠

	紫色星球 Pueple Planet 超高性价比			Elphoton INNOVATE HUMAN LIFE 超高能量转换		
	PPZ1020P5S	PPZ2020T5S	PP3535P5S S	UVC 3535RS	UVC 3535RM	UVC 3535ZL
Product Image						
Peak Wavelength	260~280nm	260~280nm	260~280nm	260~280nm	260~280nm	260~280nm
PWR Range	8~12mW	25~30mW	8~12mW	15~20mW	40~90mW	130~150mW
FWD Current	40mA	100mA	40mA	40mA	100~150mA	350mA
PKG Dimension	3.5*3.5*1.3	3.5*3.5*2.6	3.5*3.5*1.6	3.5*3.5*0.9	3.5*3.5*0.9	3.5*3.5*1.35

UVC杀菌模组

PPM-DT5

输入电压	12 / 24V	尺寸	17.4-132mm
工作电流	300mA	流速	2-2.5L
灯珠光功率	150mW	应用	净水机

PPM-JT2

输入电压	DC12/24V	出光角度	120度
工作电流	40mA	辐射通量	8-12mW
开孔尺寸	R17.5mm	应用	加湿器

PPM-DT1

输入电压	DC12V	尺寸	33-20-55mm
工作电流	150mA	流速	1-1.5L
灯珠光功率	50-70mW	应用	净水机

PPM-JT3

输入电压	DC12/24V	出光角度	120度
工作电流	40mA	辐射通量	8-12mW
开孔尺寸	R27.5mm	应用	加湿器

PPM-JT1

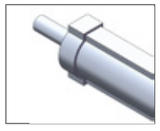
输入电压	DC12/24V	出光角度	120度
工作电流	40mA	辐射通量	8-12mW
开孔尺寸	R13mm	应用	加湿器 / 足浴盆

PPM-JT6

输入电压	DC12/24V	出光角度	120度
工作电流	40mA	辐射通量	8-12mW
开孔尺寸	R17.5mm	应用	加湿器

PPM-JT2A

输入电压	DC12/24V	出光角度	120度
工作电流	40mA	辐射通量	8-12mW
开孔尺寸	R17mm	应用	水箱



PPM-DT（金属系列）

输入电压	DC12/24V	出光角度	120度
工作电流	300-1000mA	辐射通量	150 - 350mW
流速	5/10/15L	接口规格	三 / 四分口

UVC LED灯管

UVC LED T5 SIZE: 135mm 211mm 287mm
SIZE: 96-128mm 216-288mm 312-416mW

项目	135mm规格
灯管类型	DUV LED直管双端双针灯管(T5)
灯管尺寸	直径*长度=15mm*150mm
外壳材料	航空铝材+石英玻璃灯罩
PCB材料	印刷线路单面铝基板
其他元件	含电阻、IC、电容、稳压管等电子器件若干

UVC LED T8 SIZE: 300mm 438mm 600mm 900mm
SIZE: 550mW 660mW 1100mW 1800mW

项目	438mm 规格
灯管类型	UVC LED直管双端双针灯管(T8)
灯管尺寸	直径*长度=26mm*438mm
外壳材料	航空铝材+石英玻璃灯罩
PCB尺寸	长*宽*厚=416*20*1mm
其他元件	含电阻、IC、电容、稳压管等电子器件若干

AQUATECH CHINA 2025 亚洲水技术展览会
荷兰阿姆斯特丹国际水处理展览会·中国展

About Us 关于我们:

Aquatech China 2025 亚洲水技术展览会将于 2025 年 11 月 5-7 日在上海新国际博览中心隆重举行！展会将由荷兰 RAI 锐昂展览集团、锐昂展览（上海）有限公司和北京国际展览中心有限公司主办。
Aquatech China 2025 will be held from 5 to 7 November 2025 at the Shanghai New International Expo Centre, organized by RAI China and Beijing International Exhibition Centre Co., Ltd.

作为一个完全专注于水领域的专业展会，Aquatech China 覆盖水处理全产业链，包含净水、水与污水处理、给排水管网及泵管阀、过程控制与自动化管理等领域进行全方位展示。同时还将对水的可持续发展、水处理数字化解决方案、水资源管理、水生态修复、膜技术发展、超净水、海水淡化、城市用水、工业水零排放、气候变化等多个话题进行深入的交流与探讨。
Aquatech is all about water and solely about water: it is Aquatech' s firm belief that the complexity of the challenges surrounding water and the environmental impact requires full focus worldwide. The programme includes water/wastewater treatment, infrastructure: transport & storage, process control, software & automation, point of use / point of entry and other areas for comprehensive display. There will also be in-depth exchanges and discussions on various topics such as sustainable water development, digital solutions for water treatment, water resources management, water ecological restoration, membrane technology devel opment, ultra-pure water, desalination, urban water, zero industrial water discharge and climate change as related to water.

Contact Us 联系我们:

侯女士 Wendy Hou
电话 Phone：+86 21 3336 -713 ext 8056
邮箱 E-mail：w.hou@aquatechexpo.com
网址 Web：www.aquatechexpo.com

< 关注我们 >

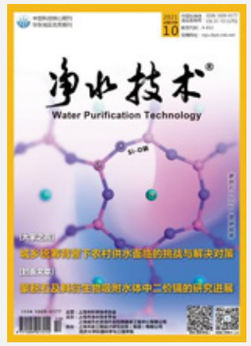
< 观众登记 >

SHANGHAI WATER PURIFICATION TECHNOLOGY PERIODICAL PRESS
上海《净水技术》杂志社

About Us 关于我们:

上海《净水技术》杂志社（www.jsjs1982.com）成立于 2001 年，是一家现代化咨询服务机构，业务以《净水技术》期刊为核心，结合行业需求和自身优势，衍生发展出学术出版、市场服务、情报咨询、水务科普、专业培训等多个业务板块。《净水技术》融媒体发展，与"净水技术"、"净水万事屋"和"水悟堂"等新媒体账号形成全媒体矩阵，覆盖面广、信息量大、表现形式丰富，具有良好的行业美誉度。

Welcome To Subscribe 欢迎订阅:



《净水技术》为月刊，被中国科技核心期刊等多个数据库收录，报道领域涉及市政给排水、工业水处理和水环境领域中的新技术与工艺、新材料与设备、新检测方法、创新管理技术及典型工程应用，适读对象包括国内外水务行业相关政府、高校、研究院、设计院、运营单位、工程公司和设备厂商等。

<订阅二维码>

《对标国际·供水实践进展》是通过对国外文献的学习阅读、精心筛选、专业译制并分类汇编的实用国外文献资讯合集，每月编制一册，内容包括国际供水行业知名团体或机构发布的最新运行实践经验总结、新技术或新设备的应用经验和精选自水行业权威期刊的最新科研动态原创论文等。

<订阅二维码>