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Arab Water World
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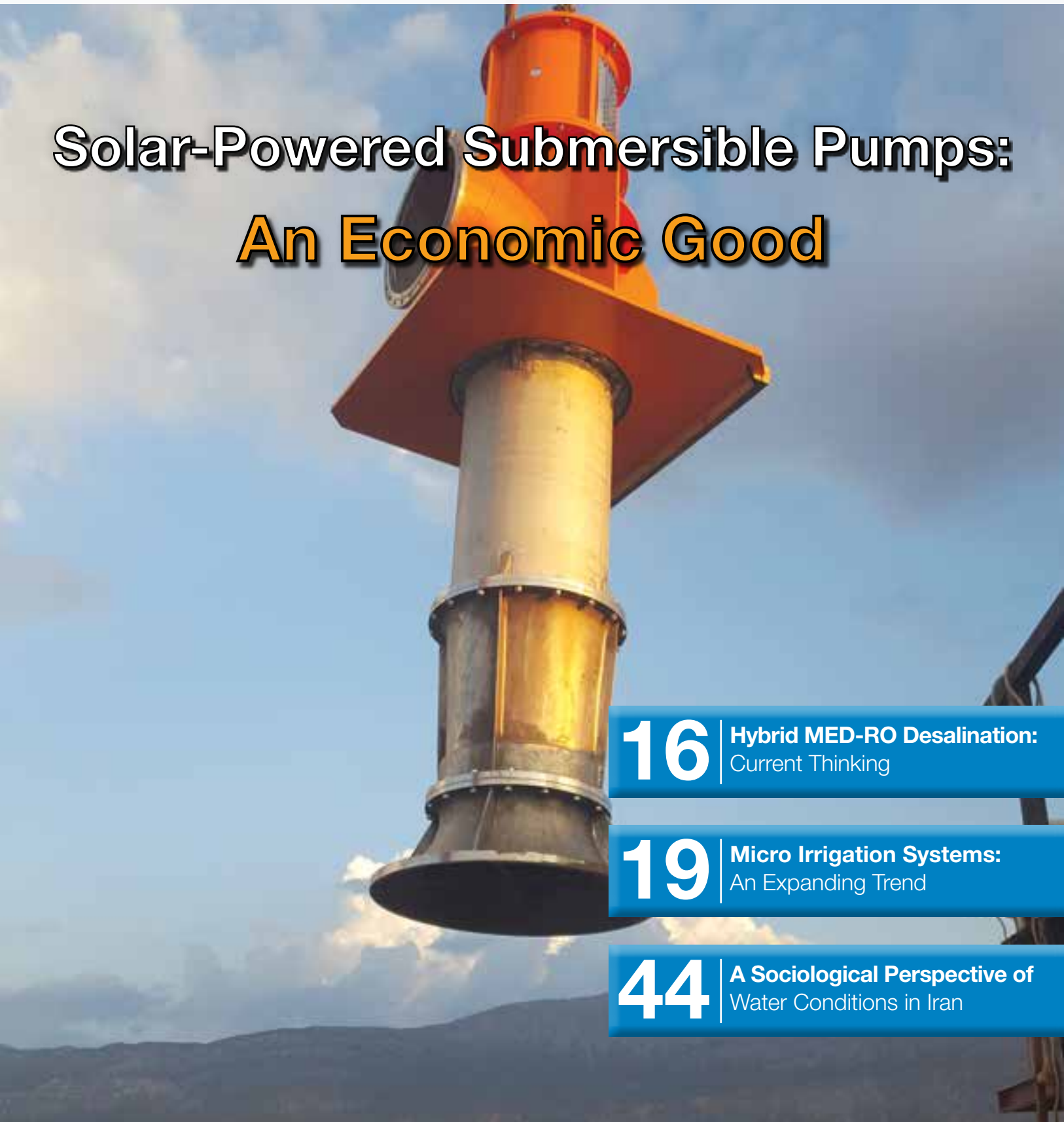

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The Red-Dead Transfer

ربـــط البحـــر بالبحـــر

On 26 February 2015, Jordan, Palestine and “Israel” signed an agreement to implement the initial plan of the Red-Dead Canal Project (Read Sea – Dead Sea Canal), which aims to transport water to the Dead Sea that might dry by 2050. The Dead Sea has some of the most saline water on earth. Its surface and shores are also considered Earth's lowest elevation on land. Meanwhile, conditions which increased from its salinity include the reduction in water flows from the Jordan River due to the diversion of water to "Israel" by Degania Dam at the point of contact between the Sea of Galilee and the Jordan River. In addition to, water flowing naturally to the Dead Sea and installed irrigation devices in Jordan, Palestine and "Israel".

The idea was first proposed by *William Allen* in 1855 in a work called 'The Dead Sea – A new route to India'. At that time, it was not yet known that the Dead Sea lies below sea level. In January 2013, the **World Bank** announced that linking the Dead Sea to the Red Sea is possible and can reduce and control environmental risks; saying that the best way would be to build a "pilot" pipe 180 km long from the Red Sea to the Dead Sea.

The new agreement states that 200 million cubic meters of water per year from the Red Sea will be dragged north to a desalination facility in Aqaba. Roughly 80 million cubic meters of fresh water would be produced; 30 to 50 percent of it would be taken to occupied territories (Eilat). Furthermore, Jordan would receive 30 million cubic meters to meet the needs of the southern part of the kingdom and it would also receive 50 million cubic meters of fresh water for northern regions. Moreover, Jordan will sell an extra 30 million cubic meters to the **Palestinian Water Authority**, according to the agreement.

بتاريخ ٢٦ شباط/فبراير ٢٠١٥، وقّع الأردن وفلسطين و"إسرائيل" اتفاقا لتنفيذ المرحلة الأولى من مشروع بناء قناة تربط البحر الأحمر بالبحر الميت الذي قد تجف مياهه بحلول العام ٢٠٥٠. يُعتبر البحر الميت البحر الأكثر ملوحة على سطح الأرض والأكثر انخفاضا. أما الأمر الذي ساهم في زيادة ملوحته فهو تدني كمية المياه التي كانت تصله من نهر الأردن بسبب تحويل المياه إلى "إسرائيل" بواسطة سد دغانيا المقام على نقطة الاتصال بين بحيرة طبريا ونهر الأردن وسحب المياه المتدفقة طبيعيا إلى البحر الميت وأجهزة الري المنصوبة في الأردن وفلسطين و"إسرائيل".

اقترح الأميرال البريطاني (وليم آلن) عام ١٨٥٥ وكفكرة أولى تنفيذ مشروع "البحر الميت - طريق جديد للهند" علماً بأن البحر الميت لم يكن يُعرف بأنه تحت مستوى البحر. وفي كانون الثاني/ يناير ٢٠١٣، أعلن البنك الدولي أن ربط البحر الميت بالبحر الأحمر هو أمر ممكن ومجدي ويمكن خفض المخاطر البيئية والسيطرة عليها معتبرا أن أفضل طريقة لنقل مياه البحر الأحمر إلى البحر الميت ستكون عبر أنابيب تمتد لمسافة ١٨٠ كيلومترا.

تنص تفاصيل الاتفاق على جر ٢٠٠ مليون متر مكعب سنويا من مياه البحر الأحمر على أن يتم تحلية حوالي ٨٠ مليون متر مكعب في محطة لتحلية المياه ستقام في العقبة وستحصل "إسرائيل" من هذه المياه على حصة تتراوح بين ٣٠ إلى ٥٠ مليون متر مكعب من المياه العذبة يتم ضخها إلى مدينة إيلات. أما الأردن فيحصل على ٣٠ مليون متر مكعب لتلبية احتياجاته في جنوب المملكة وأيضا على ٥٠ مليون متر مكعب من المياه العذبة في المناطق الشمالية. كما ينص الاتفاق على بيع الأردن للسلطة الفلسطينية ٣٠ مليون متر مكعب.

Fathi Chatila
Editor-in-Chief

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Bahrain

averda Partners with Bahrain

Waste management provider, **averda**, has added Bahrain to their growing list of partners in the GCC following an international tender which averda won on technical and financial merit. In a 5 year contract signed in Bahrain on the 8th of December with the **Ministry of Works, Municipalities and Urban Planning**, the company will deliver a range of waste management and sustainable solutions using proven systems and technology tailored to the kingdom's specific needs. The partnership is timely as environmental issues in the GCC are becoming ever more important, with member states now seeking sustainable solutions using proven methods and technology to safeguard the environment for future generations. The agreement with averda, was signed by *Essam bin Abdulla Khalaf*, Bahrain's Minister of Works, Municipalities and Urban Planning and *Maysarah Sukkar*, Chairman of averda. This development is in alignment with Bahrain's 5 year environmental plan and will ensure that the kingdom benefits from the best solutions tailored to fit its specific needs, while offering the best return on investment.

Jordan

First Utility-ScaleWind Farm in Middle East

King Abdullah II Ibn al-Hussein of the Hashemite Kingdom of Jordan inaugurated the first utility-scale wind power project in the Middle East with high-level officials from across the Middle East in attendance, including Prince *Talal bin Muhammad*; Dr. *Abdullah Ensour*, the Prime Minister of Jordan; Dr. *Sultan Al Jaber*, UAE Minister of State and Chairman of **Masdar**; Dr. *Ibrahim Saif*, Jordan Minister of Energy and Mineral Resources; *Bilal Rabie Bilal Al Bodour*, UAE Ambassador to Jordan; and Dr. *Ahmad Belhoul*, CEO of **Masdar**. Built by the **Jordan Wind Project Company (JWPC)**, the wind farm is a joint project of Masdar, **InfraMed** and **EP Global Energy**. Jordan has long relied on fuel imports, especially diesel, to electrify the country's homes and businesses as the nation lacks sufficient domestic energy supplies. The Tafila Wind Farm puts Jordan firmly on the renewable energy map. It will account for almost ten percent of Jordan's renewable energy target for 2020.

Kuwait

Azzour North One Plant on Right Track

Shamal Azzour Al-Oula KSC celebrated the on-schedule crossing of the 664.2 megawatt power production milestone, representing 40 percent of total power output, by its Azzour North One power and water desalination plant. The plant is Kuwait's first independently owned plant established under Kuwait's Public Private Partnerships (PPP) law of 2008. Azzour North One power and water plant is the first gas-fired combined cycle power and water desalination plant in Kuwait, and will have a capacity exceeding 1,500 megawatts (MW) of electricity and 107 million imperial gallons of water per day (MIGD) once completed by the fourth quarter of 2016. This represents 10 percent of Kuwait's power capacity and 20 percent of Kuwait's water capacity. Shamal Azzour Al-Oula Chairman *Yousef Al Hajri* said, "We are very proud to announce the crossing of this major milestone today and we are on schedule to operate at 100 percent capacity by the last quarter of next year."

Morocco

Wastewater Treatment Plant Inaugurated

The Moroccan King, *Mohammed VI*, recently held an official visit and inauguration ceremony to mark the achievements of the Boukhalef wastewater treatment plant rehabilitation project completed by **Biwater**. During event proceedings, King Mohammed VI was welcomed by crowds of local citizens who were delighted to witness his arrival at the facility in Tangier. While at the Boukhalef site, he conducted

on golf courses. Civil engineering works were required alongside the installation of new electromechanical equipment, electricity and automation processes and tertiary treatment facilities. Ahead of 2017, the facility will be expanded to increase capacity with additional clarification tanks constructed.

Palestine

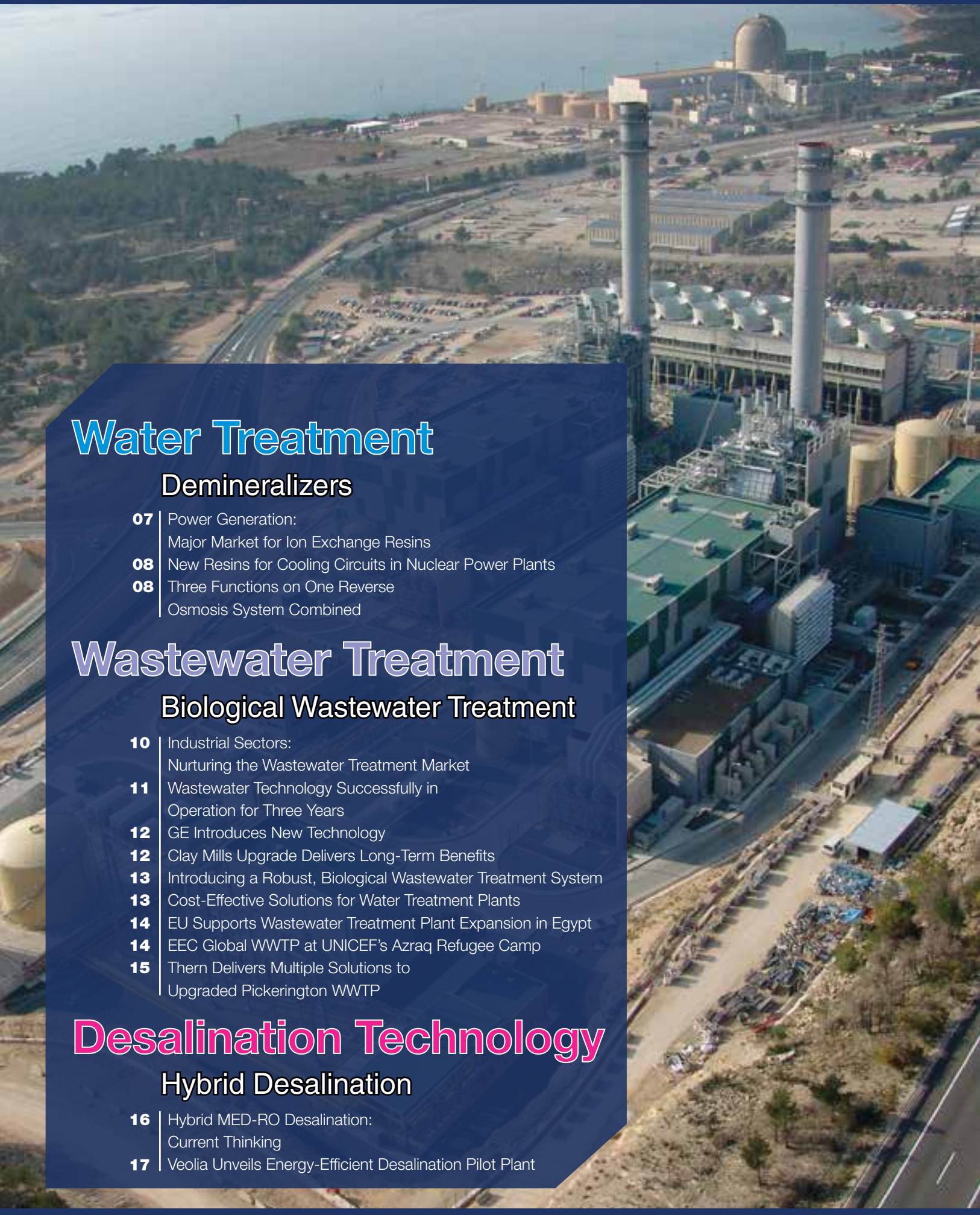
UAE & Palestine Sign MoU

Dr. *Rashid Ahmed Bin Fahad*, UAE Minister of Environment and Water and Dr. *Sufian Sultan Al-Tamimi*, Minister of Agriculture, **Palestinian Authority**, have signed a memorandum of understanding (MoU) in the field of agriculture and animal and fish farming. According to Bin Fahad, the UAE is keen to establish partnerships with countries in the region and across the world to address various environmental issues, especially when it has emerged as a leader in the field of environment. He pointed out that the MoU aims to strengthen and develop cooperation between the UAE and the State Palestine in agriculture and animal and fish farming in order to achieve sustainable development goals. Under the terms of the agreement, the UAE and Palestine will share their experiences in areas, including agricultural scientific research, fight against desertification, and the use of saline water in agriculture. In addition, both parties will exchange their expertise in soil and water, extension of agricultural areas, date palm cultivation, and other agricultural products along with fishing and fish farming areas.

Qatar

SNC-Lavalin to Develop Recycling Plant

SNC-Lavalin is pleased to announce that it has been awarded a contract by **Qatargas** for a Water Recycling Facility at its Laffan Refinery 2 plant in Ras Laffan Industrial City, Qatar. SNC-Lavalin is providing engineering, procurement, supply, construction and commissioning services for the Recycling Facility to handle treated industrial water from the Laffan Refineries 1 and 2. The contract is expected to be completed in the first quarter of 2017. The recycling system is designed to reuse treated industrial water produced by the industrial plants. The system mainly consists of ultrafiltration and reverse osmosis with ancillary facilities. Purified water will be recycled back to the refineries for use in the cooling and boiler feed water systems. “We are delighted to play a key role in delivering this sustainable project, which contributes to Qatargas meeting its environmental commitments, and bringing the system safely into operation,” said *Christian Brown*, President, Oil & Gas. “We have been working with Qatargas for 12 years and look forward to continuing our successful relationship.”



Water Treatment

Demineralizers

Wastewater Treatment

Biological Wastewater Treatment

Desalination Technology

Hybrid Desalination

Photo Courtesy of GE

Power Generation:
Major Market for Ion Exchange Resins

Demineralization of water is the removal of essentially all inorganic salts by ion exchange. Demineralization produces water similar in quality to distillation at a lower cost for most fresh waters, as stated by ***General Electric (GE)****. The ion exchange market is growing as every demineralizer system consists of one or more ion exchange resin. According to* ***Global Industry Analysts' (GIA)*** *recent report, the global market for Ion Exchange Resins is projected to reach USD1.8 billion by 2020, driven by widening application areas, surging population and emerging markets with large scale industrial activity. Asia-Pacific represents the largest as well as the fastest growing market worldwide with a projected CAGR of 5.6 percent over the analysis period (2015 – 2020).*

Major end users

As stated by the new market research report on Ion Exchange Resins, growing industrialization has created an imperative need for conservation and re-use of water, especially in India, Taiwan, China, and other developing countries. The scenario magnifies the need for ion-exchange resins for water treatment systems. Power generation represents the largest end use application for ion exchange resins, while drinking and wastewater treatment ranks as the fastest growing end-use market. By the same token, a report published by **Research and Markets** reveals that the ion exchange resin industry depends on industrial growth. The majority of the use of these resins takes place in water purification plants. Nuclear power generators and thermal power plants require water which is ultrapure. Ultrapurification processes employ ion exchange resins. Thus, these industries drive the demand for ion exchange resins in a stable manner.

Market segmentation

The ion exchange resins market is segmented into four types: cation exchange resins, anion exchange resins, chelation resins and adsorbent resins, according to another report published by **MarketsandMarkets**. These individual ion exchange resin types have application specific demands that are differentiated by placement, cost and efficiency. The market for cation exchange resins market in terms of value is projected to reach USD983.33 million by 2019, growing at a CAGR of 6.32 percent from 2014 to 2019. The Asia-Pacific region dominated the ion exchange resins market in 2013 and is expected to be the fastest growing market in terms of value, from 2014 to 2019, owing to rising consumption in this region, where end-user markets of ion exchange resins are growing especially in power generation and water and wastewater treatment, adds the report. Furthermore, the market research company discusses the major suppliers in the market. The ion exchange resins market is consolidated, where the **Dow Chemical Company** (U.S.), **Lanxess AG** (Germany), **Purolite Corporation** (U.S.), **Thermax Ltd.** (India), **Mitsubishi Chemical Holding Corporation** (Japan), **Ion Exchange** (India) **Ltd.** captured majority of the market share in production and supply. Research analysts at **BlueTech Research** state that DOW has been the clear market leader since the acquisition of **Rohm and Haas**, holding an estimated 40 percent of the market. Purolite and Lanxess control roughly 10-15 percent of the market, while Mitsubishi holds around 3-5 percent of the global market share. The market offers a competitive space where the companies, as advised by MarketsandMarkets, need to challenge each other with respect to prices and a wide product range with an advanced technology in order to meet the market requirements. ■

> *"The Asia-Pacific region […] is expected to be the fastest growing market in terms of value"*

Dana Hani
Assistant Editor & Researcher

إن إزالة التمعدن هي عملية إزالة جميع الأملاح غير العضوية بشكل أساسي بواسطة التبادل الأيوني. تؤدي إزالة الأملاح المعدنية إلى إنتاج مياه ذات جودة مماثلة للتقطير بكلفة أقل لمعظم المياه العذبة وذلك وفقا لتقرير صادر عن (جنرال إلكتريك). تنمو سوق التبادل الأيوني ذلك لأن كل نظام لإزالة التمعدن يتكون من راتنج التبادل الأيوني أو أكثر. وأشار تقرير حديث صادر عن (Global Industry Analysts) إلى أن السوق العالمية لراتنجات التبادل الأيوني من المتوقع أن تصل إلى ١,٨ مليار دولار أمريكي بحلول العام ٢٠٢٠ مدفوعة بمجالات التطبيق الواسعة وتزايد عدد السكان والأسواق الناشئة ذات النشاط الصناعي على نطاق واسع. تمثل منطقة آسيا والمحيط الهادئ أكبر وأسرع الأسواق نموا حول العالم مع توقعات بأن يبلغ معدل النمو السنوي المركب ٥,٦ في المئة في الفترة الممتدة من ٢٠١٥ إلى ٢٠٢٠.

New Resins for Cooling Circuits in Nuclear Power Plants

Lewatit ion exchange resins

As part of the technical exhibition accompanying **VGB PowerTech e.V.**'s "Chemistry in Power Plants" conference, **LANXESS** presented both tried-and-tested and innovative one-stop solutions for treating water in power plants. With their exceptional mechanical, chemical and osmotic stability, Lewatit KR ion exchange resins were developed specifically for nuclear plants. The very narrow particle size distribution and, in particular, a very low proportion of fine particles result in lower pressure losses compared with standard heterodisperse resins. The new, ready-to-use gel-type mixed bed resin Lewatit MonoPlus SM 1015 KR comprises equivalent proportions of the anion exchange resin Lewatit MonoPlus M800 KR and the relatively highly cross-linked cation exchange resin Lewatit MonoPlus S 215 KR. It benefits from further improved stability, especially against oxidation, which means it has a longer service life and is therefore even more cost-effective. What's more, the cation exchange resin's higher degree of crosslinking reduces leaching, which produces water with lower TOC (total organic carbon) values. At the same time, the greater selectivity for alkali metal ions such as sodium improves the condensate quality. *Hans-Jürgen Wedemeyer*, Manager Technical Marketing in the LANXESS LPT business unit, defines the properties as follows: "The cation exchange resin has a total capacity of over 2.4 equivalents per liter and releases less than 10 ppb TOC. Outstanding water quality with specific resistances of more than 10 megohm*cm can be achieved." ■

Three Functions on One Reverse Osmosis System Combined

OriginClear Inc., a well-known provider of water treatment solutions, announced that its wholly-owned subsidiary, Dallas-based **Progressive Water Treatment Inc. (PWT)**, has commissioned, or put into operation, a 750 gallon per minute (GPM) Multiple Media Filtration, Softener and Reverse Osmosis (RO) system for a 75,000 barrel-per-day refinery operated by **Delek Refining** in Tyler, Texas. Valued at more than USD1 million, paid before the OriginClear acquisition, the water processing system is PWT's largest single unit to date, and includes advanced process technologies that are new to the refinery and its operators. "I wanted to personally congratulate Progressive Water Treatment for a well-executed project from design, fabrication, construction support and start-up," said *Randall Goodspeed*, Manager of Capital Projects for Delek's Tyler refinery. "The self-imposed delay between delivery and installation/startup made this project particularly challenging. Both Delek and PWT had concerns with long term storage of a unit of this type which were proven to be unfounded. The smooth start-up, and the support since, have placed PWT in a position as a top supplier to Delek. We look forward to working with PWT in maintaining this relationship for many years to come." PWT engineers designed an RO skid that is physically the largest single piece of equipment the company has ever built. PWT responded to the client's request to combine all three RO units onto one common frame. At the time it was shipped, it required a special extra-wide, extra-high convoy. The new system replaces a water softening system that has been in service for more than 30 years. It treats boiler feed water by removing suspended solids and dissolved particles, creating steam for refinery processes. ■

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Industrial Sectors:
Nurturing the Wastewater Treatment Market

*Industrial wastewater is produced as a by-product of industrial activities by almost every industry sector. According to **Food and Agriculture Organization (FAO)**, it is the fastest growing sector of the global water market. The physical and chemical characteristics of industrial wastewater treatment require an array of treatment methods and technologies. Furthermore, the market for industrial water treatment technologies is set to expand by more than 50 percent over the next five years, from an estimated USD7 billion in 2015 to more than USD11 billion in 2020. Water technology companies are making the most out of the pressing need to treat and manage water in the face of the global water resource scarcity. Research has been done on the major wastewater producing industries. In parallel, another research has examined the biggest industry spenders on wastewater treatment technologies.*

Research findings

Starting with the first study, **BlueTech Research** recently developed a comprehensive model for determining the quantities of wastewater and biochemical oxygen demand that some of the major industries are producing. The selected industries featured include pulp and paper processing and manufacturing, chemicals production, meat and poultry (slaughterhouses), pharmaceuticals production and dairy processing. The calculations were based on the volumes of wastewater generated per unit of product processed or manufactured. The findings reveal that the pulp and paper sector has the highest estimated volumes of wastewater and BOD generated, more than one third of the total volumes studied. The meat and poultry sector is the third largest wastewater producing industry and the second largest BOD producing industry in terms of total volume and mass, respectively, due to the high BOD concentration in these wastewaters. Moving on to the second research, a **Global Water intelligence (GWI)** report reveals that the upstream oil and gas and food and beverage industries will lead the way in capital spending on water and wastewater treatment technologies in 2015, while three major industrial areas account for more than half of total spending: oil and gas, food and beverage and mining. In food and beverage, technology suppliers are developing anaerobic treatment technologies that are more efficient and easier to operate, and which industrial facility operators can use to take advantage of biogas production to reduce their energy costs. According to the report, increasing investment is expected in biological processes for the removal of non-organic substances such as selenium compounds – from FGD wastewater in the power and mining industries.

"… increasing investment is expected in biological processes for the removal of non-organic substances"

Market by regions

According to **Future Market Insights (FMI)**, North America is the most lucrative region in the global produced water treatment systems market, accounting for nearly one-third of the global market revenue; and Asia Pacific is the second largest market. Leading players in the treatment systems, as stated by FMI, are focusing on their unique selling position to consolidate their position in the market. For example, **Siemens** is focusing on advanced biological wastewater treatment, whereas **Aquatech** is pushing low CAPEX and OPEX biological processes. Moreover, **Technavio**'s market research analyst projects the packaged wastewater treatment market to grow at a CAGR of around 9 percent from 2015 to 2020. Also, growing environmental concerns have forced governments worldwide to set strict mandates for wastewater disposal which is promoting the use of small scale PWWT plants. ■

Dana Hani
Assistant Editor & Researcher

يتم إنتاج مياه الصرف الصناعية كمنتج ثانوي للأنشطة الصناعية في كل قطاع صناعي تقريباً. وأشار تقرير صادر عن (الفاو) بأن قطاع مياه الصرف الصناعية هو أسرع القطاعات نموا في سوق المياه العالمية. تتطلب الخصائص الفيزيائية والكيميائية لمعالجة مياه الصرف الصناعية مجموعة من أساليب وتقنيات المعالجة. ومن المتوقع أن تتوسع سوق تقنيات معالجة المياه الصناعية بأكثر من ٥٠ في المئة خلال السنوات الخمس المقبلة، لترتفع من ٧ مليار دولار أمريكي في العام ٢٠١٥ إلى أكثر من ١١ مليار دولار أمريكي في العام ٢٠٢٠. وتستغل شركات تقنيات المياه إلى أقصى حدّ الحاجة الملحة لمعالجة وإدارة المياه في وجه ندرة الموارد المائية العالمية. وقد أُجري بحث على صناعات إنتاج مياه الصرف الصحي الرئيسية. في المقابل، قام بحث آخر بدراسة أكبر منفقي الصناعة على تقنيات معالجة مياه الصرف الصحي. ومن المتوقع أن يزيد الاستثمار في تقنيات معالجة مياه الصرف الصحي.

Wastewater Technology Successfully in Operation for Three Years

Compact multi-stage biological Biomar wastewater treatment plant

Beverage bottler **ABC Atlas Bottling Maroc** contracted **Envirochemie** to plan, construct and commission two Biomar biological wastewater treatment plants. The soft drink bottling plants of an internationally well-known manufacturer are located in Tangier and Oujda. The purpose of the biological wastewater treatment plants is to ensure compliance with the Moroccan limit values for discharging treated water. Effective prevention of odor emissions is also required, since e.g. the bottler's plant in Tangier is located in the immediate vicinity of a residential area. At both locations the project encompassed the implementation of multistage biological wastewater treatment plants where wastewater is treated anaerobically using the Biomar ASBx process and aerobically using the Biomar OBR process. Since 2012 treatment quantities have ranged from 700 m^3 wastewater/day at the location in Tangier to 800 m^3 wastewater/day at the location in Oujda. An additional benefit for the customer is the biogas generated during biological wastewater treatment. This enables an energy yield of more than 3,500 KW per day, resulting in a noticeable reduction of primary energy consumption. Envirochemie engineers and scientists consult, plan, build, and maintain water treatment plants that are tailored to the respective customer requirements. Plant solutions for water recycling, resource recycling, zero discharge requirements and biogas production save valuable resources and energy. The company supplies plants "Made in Germany" to customers around the world. ■

GE Introduces New Technology


GE solutions address new EPA guidelines for treating FGD wastewater

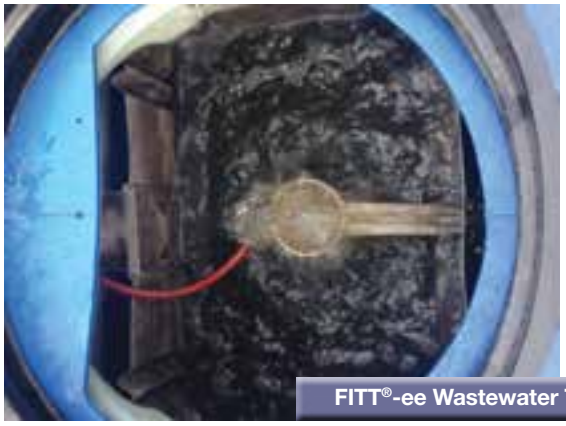
GE introduced a new evaporation/ solidification technology for flue gas desulfurization (FGD) to meet the recently released U.S. **Environmental Protection Agency (EPA)** guidelines governing wastewater discharge from steam electric and coal-fired power plants. The new EPA ELGs will reduce or eliminate toxic metals and other pollutants from entering surface waters from steam electric power plants. The new rules specifically address FGD wastewater from coal-fired power plants and identify chemical precipitation followed by biological treatment as the best available technology for treating and discharging the waste from existing plants and evaporation/pozzolanic solidification for new facilities. In addition, the ELGs identify the evaporation/solidification approach as a best available technology for eliminating FGD waste streams from existing power plants under a voluntary incentive program. GE's new technology reduces chemical addition, sludge handling and energy costs. It reduces the long-term environmental risks associated with the discharge of FGD purge water and other liquid streams from power plants. The system produces high-quality water for recycle and reuse. Specifically designed for FGD wastewater, it is cost-effective and offers significant reductions in both capital and operating expenses compared to traditional Zero Liquid Discharge (ZLD) systems. The new evaporation/solidification technology provides power plants with maximum flexibility because it can treat FGD wastewater from any type of coal and removes the risk of meeting stringent discharge requirements by eliminating liquid discharge to waterways. ■

Clay Mills Upgrade Delivers Long-Term Benefits

Sixteen **Chemineer**™ anoxic mixers, manufactured by **NOV**, have completed two years of uninterrupted service at Clay Mills STW, **Severn Trent Water**'s new Bio-P Activated Sludge Plant. The Clay Mills upgrade was a USD59.7 million design and construct contract by **MWH Treatment** as part of the e5 Alliance. Serving a domestic population of approximately 100,000 in the brewing town of Burton upon Trent, the works receives a very significant trade load, resulting in a population equivalent (PE) of 421,879 with a FFT (flow to full treatment) of 112,665m^3/d and a DWF (dry weather flow) of 47,000m^3/d. As part of AMP5, Clay Mills was given a revised and more stringent quality obligation under the UWWTD (urban waste water treatment directive) P (phosphorus) removal legislation. In the Activated Sludge Plant (ASP), which has a volume of 30,000m^3 split into four double-pass lanes, the slow speed, paddle-type GT Chemineer anoxic mixers have been suspending waste sludge solids and providing complete basin mixing, as *Richard Thomson*, e5 Project Manager, explains: "The Chemineer anoxic mixers have proved to be very robust and reliable. They have continually eliminated oxygen incorporation from the liquid surface with no swirl or vortex. They have a proven track record of performance on a number of Severn Trent sites including their largest at Minworth". Built with a high-efficiency gearbox specifically for agitator service, the modular Chemineer GT mixers have an optimized gear design and lighter weight shaft diameter requirements that makes them very energy-efficient. ■


Chemineer mixers have been a success at Clay Mills

Introducing a Robust, Biological Wastewater Treatment System



FITT®-ee Wastewater Treatment Systems

Scalable, efficient wastewater solution to significantly lower the cost of pretreatment, waste management, and better onsite sanitation, the energy-efficient "Fixed Integrated Treatment Technology" (FITT®-ee) design produces a robust, biological treatment system that combines and integrates several proven wastewater treatment process in one. Just like the **Bio-Microbics** FAST® Systems, the FITT-ee wastewater treatment systems create an optimized treatment environment by using a fixed block of media for microbial growth with an energy-efficient aeration system - which enables customers, regardless of their size, to gain a rapid return on their investment. The engineered airlift provides constant aeration and mixing throughout the media for maximum biomass activities. This method of operation also allows the system to withstand periods of high and low input which upset most treatment systems; including those in nitrogen sensitive areas or limitations with distance to groundwater and/or smaller dispersal field size requirements. Used for new construction or retrofit in existing tanks, the RetroFITT-ee and MicroFITT-ee systems are engineered to fit most typical small-flow residential and commercial applications. Bio-Microbics systems meet the highest performance and safety standards for treatment of water, wastewater, rainwater, and more. The company has developed a number of innovative products, which have revolutionized methods of dealing with the treatment of water – where infrastructure and drainage is not available. ■

Cost-Effective Solutions for Water Treatment Plants

COMS Srl is an Italian manufacturing company that provides compact and cost-effective solutions in water sector. The main products are represented by compact water treatment plants and customized skids completely designed and manufactured at its operative base in Italy. Regarding the civil applications, the company's core business is represented by compact and containerized MBR and SBR WWTPs designed specifically for wastewaters produced by little communities such as small villages and hospitals, hotel and touristic resorts, golf courts and touristic harbors, temporary construction sites and shopping malls. Furthermore COMS is also working for different industrial fields where the projects are related to primary, process and waste waters with particular attention to the following sectors: food and beverage industries; slaughterhouses; industrial laundries; manufacturing industries; metallurgical industries; chemical industries; and landfill leachate. In parallel way to the manufacturing of waste water treatment plants, COMS is working also in field of erection on different types of piping such as stainless steel, galvanized steel, HDPE and PE with the related manufacturing and assembly of mechanical machineries. The company's mission is related to help the customers to treat the water starting from smart solutions to the latest technologies available on the market by looking, first of all, at the best cost-effective plants configuration that are suitable for customer's needs towards Zero Liquid Discharge approach by maximizing the re-use of the water. ■

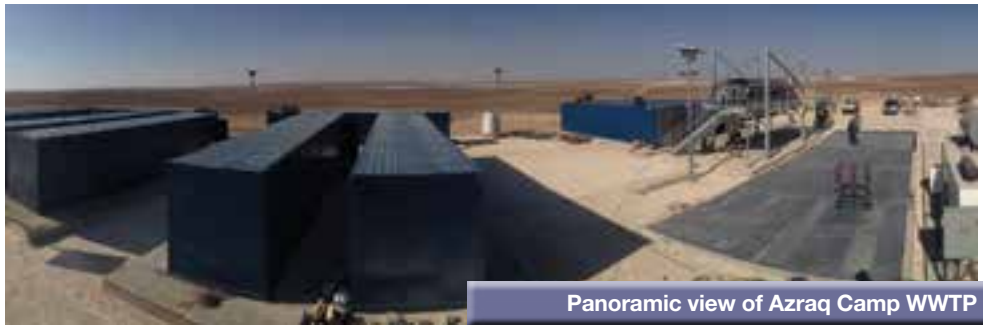
MBR Plant

EU Supports Wastewater Treatment Plant Expansion in Egypt

Within the **European Union**'s (**EU**) cooperation framework in Egypt, Ambassador *James Moran*, Head of the EU Delegation to Egypt, signed a new strategic Financing Agreement of cooperation between the EU and Egypt: the "Kafr El Sheikh Wastewater Expansion Programme". The program has been designed to improve the quality of irrigation water in the governorate. This will contribute to increasing health standards for local residents and the environmental quality of the Nile, Lake Burullus, and the Mediterranean Sea at large. The total cost of this strategic project is estimated at USD177.5 million and the total EU contribution amounts to USD34.6 million in grants. The remaining amount is covered by loans provided by the EIB and EBRD. The project supports the construction of new wastewater treatment plants and first time full wastewater collection networks in the Kafr El Sheikh Governorate, and will ensure their proper operation once they are in place. Ambassador Moran said "the project seeks to improve the quality of life of hundreds of thousands Egyptians and is a remarkable example of how local and international partners can join forces and resources". He noted that, in total, an impressive 500,000 inhabitants of the Kafr El Sheikh Governorate are estimated to directly benefit from the wastewater treatment plants and collection networks that will be provided by this project. The project is expected to create 37,000 jobs during its planning and construction phase and 1,400 permanent jobs for the operation of the new infrastructure once established. **The Holding Company for Water and Wastewater (HCWW)** representing the **Ministry of Housing, Utilities and Urban Development** is the local partner of this project, whose direct beneficiary is the **Kafr El Sheikh Water Supply and Sanitation Company (KSWSSC)**. ■

EEC Global WWTP at UNICEF's Azraq Refugee Camp

EEC Global's affiliate, EEC USA, assisted **UNICEF** and the **Government of Jordan (GoJ)** help the substantial Syrian refugee population living in Jordan by providing a turn-key solution for a package wastewater treatment plant (WWTP) at the Azraq Refugee Camp. The system re-uses EEC equipment donated by **NATO** and the **US Army** that successfully operated at Kandahar Airfield in Afghanistan for eight years. The resulting effluent will be treated to enable re-use to irrigate fodder crops thereby supporting the local economy in one of the driest places in the world. This project highlights the multiple technical strengths EEC's package WWTP moving bed bioreactor (MBBR), an aerobic, biological-based WWTP solution. EEC has delivered hundreds of plants worldwide since initially developing the technology over two decades ago. EEC's MBBR offers a compact, plug-and-play package solution manufactured for delivery via standard ISO shipping containers with a low power draw which effectively treats a broad range of wastewater influents. The system readily integrates with additional components (e.g.: sludge dewatering) to address all client needs. EEC's technical and management team successfully engaged multiple stakeholders (UNICEF, GoJ Ministry of Water and Irrigation, **USAID**, US Army, NATO Support Agency) to define the project's requirements and a successful technical solution. The company's effective balance of listening and leading resulted in a solution which enables UNICEF to realize substantial cost savings compared to the current practice of trucking the wastewater two hours to a municipal WWTP. ■



Panoramic view of Azraq Camp WWTP

Thern Delivers Multiple Solutions to Upgraded Pickerington WWTP

Model 4771

Since 1974, when **Pickerington** built its first water treatment facility, it has seen its population quadruple in size. The basic need for clean water didn't change, but the required processing capacity did. Population growth began to overwhelm the local utility's capabilities and, as a result, the city began the largest upgrade to its water treatment system in its history. The 19-month, USD11 million project effectively doubled the size of Pickerington's wastewater treatment facility, increasing capacity from 1.6 to 3.2 million gallons per day. The upgraded facility had needs of its own – in order to operate properly the right equipment is required. Their specialized needs would bring them to **Thern**. A typical job, the Pickerington upgrade opened the project to bids from vendors wishing to supply the equipment required for the various processes. **Tri-State Tool and Hoist** is one such vendor and a very active Thern distributor in Ohio. After reviewing Pickerington's needs, Tri-State worked closely with Thern to put together a package of wastewater davit cranes and small electric winches ideally suited to the various jobs called out for the facility. Thern products were selected for three different applications. First, they required a means to lift a trash basket during pre-treatment. For this Thern supplied a model 572 davit crane with corrosion resistant epoxy finish with a mounted 4WS3M6ERGRA-K-P16 electric winch. Next, Thern supplied a set of four model 4771HCRLS-P1 electric winches. The upgraded facility features four digester tanks. Each tank has a pivoting drain pipe that helps regulate the water level within the tank. Finally, Pickerington ordered a single model 5122M3GAL portable davit crane with galvanized finish, stainless steel hand winch and six matching stainless bases. This crane lifts pumps and mixers for maintenance at six different stations at the facility. ■

Hybrid MED-RO Desalination: **Current Thinking**

Desalination has become an appealing option that addresses dwindling fresh water supplies as countries seek solutions on how to tackle water scarcity caused by population growth, climate change, pollution, and industrial development. In addition to this, the industries have done much to lower the cost of desalination. Advances in technology have led to increased energy efficiency, where greater economies of scale have also helped lower costs helping the growth of the overall water desalination equipment market. Desalination is a process that separates dissolved salts and other minerals from seawater or other salinized/brackish water, according to ***Markets and Markets****. It is considered as a substitute and sustainable supply of fresh water with the required quantity and quality. The major benefit of desalination is that it can continue to deliver high-quality drinking water for consumption, even during periods of drought. It also provides an alternative source of water that will make overall supply more diverse and less vulnerable to interruption.*

Desalination technologies

The two major types of desalination technologies used around the world can be broadly classified as either thermal processes, in which feedwater is boiled and the vapor condensed as pure water (distillate), or membrane desalination processes, in which feedwater is pumped through semi-permeable membranes to filter out the dissolved solids. The main thermal processes are multi-stage flash distillation (MSF), multi-effect distillation (MED) and vapor compression variants – thermal and mechanical (TVC, MVC). The main membrane process is reverse osmosis (RO), according to a report by **World Nuclear Association**. Meanwhile, hybrid thermal-membrane plants have a more flexible power-to-water ratio, efficient operation even with significant seasonal and daily fluctuations of the electricity and water demand, less primary energy consumption and an increase of plant efficiency, thus improving economics and reducing environmental impacts. MSF+RO or MED-TVC+RO hybrid plants exploit the best features of each technology for different quality products or a blended product.

Several thermal distillation processes capable of using waste heat from power generation are in use: Multi-stage flash (MSF) distillation process using steam, was earlier prominent. It works by flashing a portion of the water into steam in multiple stages of what are essentially countercurrent heat exchangers. It is more energy-intensive than MED, but it can cope with suspended solids and any degree of salinity.

"… hybrid thermal-membrane plants have a more flexible power-to-water ratio"

The largest market for water desalination

The Middle East region holds the largest market for water desalination equipment with the most number of activities in utilities and construction end-uses in countries like Saudi Arabia, the United Arab Emirates, Kuwait, and Qatar. The demand for desalinated water in the municipal as well as industrial markets of oil and gas and the chemical and power sectors is boosting the regions global position, according to Markets and Markets. In recent years, MED technology is catching up and is likely to become more widespread due to its lower energy demand and significant potential for further development. Given the high salinity and high temperature of the Gulf water, thermal desalination technologies usually are better suited. Elsewhere, however, the high dependence on fossil fuels in cogeneration was seen as disadvantageous.

Furthermore, RO is based on moving pressurized brine across membranes that allow fresh water to pass through and retain salts, thus increasing the

Reverse osmosis desalination plant in Skikda, Algeria

brine concentration on one side and producing fresh water on the other. The earlier distillation processes use constant amounts of energy per unit of water processed, according to a new report by the **World Bank**. In contrast, energy use per unit of water in RO plants increases as the input water quality deteriorates. In addition, RO plants require only electrical energy; thus, they neither must be located near the sea nor directly linked to a cogeneration power station. Initially, RO membranes were expensive; pretreatment was not well understood; and energy consumption was high. Since then, membrane prices have fallen; their performance has improved; pretreatment is better understood; and energy consumption has dropped dramatically. Hybrid configurations of different desalination technologies also are being used to optimize the benefits from each technology.

"The Fujairah 2 is part of the largest hybrid desalination plant in the world"

The high drinking water demand in the UAE does not vary substantially with the seasons whereas the power demand does: during summer, the power demand is high due to the use of air-conditioning while it is lower during the winter months. Therefore, the innovative hybrid MED-RO solution, the Fujairah 2 (F2), was called for to best match the demands from a cost as well as a performance perspective. This design is the most energy efficient solution for production of desalinated water today, according to a report by **Veolia**. The Fujairah 2 is part of the largest hybrid desalination plant in the world linked to a 2,000 MW power plant and a 450,000 m^3/day thermal desalination plant. ■

Rasha Reslan
Editor & Researcher

أصبحت تحلية المياه خياراً مغرياً ومطلوباً لمعالجة تضاؤل إمدادات المياه العذبة إذ تبحث الدول عن حلول لمواجهة ندرة المياه الناجمة عن النمو السكاني وتغير المناخ والتلوث والتنمية الصناعية. بالإضافة إلى ذلك، فقد بذلت الصناعات الكثير من الجهد لخفض تكلفة تحلية مياه البحر. وقد أدّى التقدم التكنولوجي إلى زيادة كفاءة الطاقة حيث ساعدت الاقتصادات الأكبر حجما أيضاً على خفض التكاليف مما ساعد في نمو سوق معدات تحلية المياه بشكل عام. تهدف عملية تحلية المياه إلى فصل الأملاح الذائبة والمعادن الأخرى عن مياه البحر أو المياه المالحة/المسوسة الأخرى وفقا لتقرير صادر عن (Markets and Markets). وتعتبر هذه العملية بديلا وإمدادا مستداما للمياه العذبة مع الكمية والجودة المطلوبة. أما الفائدة الرئيسية من تحلية مياه البحر فتكمن في إمكانية توفير مياه شرب عالية الجودة للاستهلاك حتى أثناء فترات الجفاف. وتمتلك منطقة الشرق الأوسط أكبر سوق لمعدات تحلية المياه مع وجود أكبر عدد من الأنشطة في المرافق والإنشاءات في دول مثل المملكة العربية السعودية والإمارات العربية المتحدة والكويت وقطر.

Veolia Unveils Energy-Efficient Desalination Pilot Plant

Veolia, through its desalination specialist **SIDEM**, has been collaborating on **Masdar**'s ambitious Renewable Energy Water Desalination Program. The pilot program aims to test and develop advanced, energy-efficient seawater desalination technologies, with the long-term goal of implementing renewable energy-powered desalination plants in the United Arab Emirates. As technology partners, Veolia and Masdar have shared the costs to build and operate a pilot plant with the same characteristics as future large scale, innovative and low energy consumption desalination plants. The pilot plant, built in the Ghantoot area, has been producing potable water since August, abiding by the same operation constraints as a large plant and capable of handling very harsh seawater conditions (salinity up to 52 g/l, temperature which may exceed 42°C and harmful algal blooms). The results obtained so far are extremely promising: Veolia has already lowered the electrical consumption performances by 7 percent compared to the contractual target initially required by Masdar, and is still improving on that every day. These energy cost savings can be added to those generated by a new pretreatment design which can save 25 percent on civil works and, therefore, reduce the footprint of the plant as well as its CAPEX. The innovative technologies that Veolia has developed and implemented at Masdar include high performance seawater pretreatment combining air floatation and filtration, as well as a new osmosis membrane feed configuration able to deal with high treatment fluxes. ■

3D model of SIDEM, Masdar pilot plant

Feature

Irrigation Technology

Micro Irrigation Systems: **An Expanding Trend**

Global micro irrigation systems market was USD 2.48 billion in 2014 and is expected to witness rapid growth owing to factors such as growing population and increasing food demand. These systems are low to medium pressure systems that provide water for numerous applications as spray, sprinkle, drip and mist. Micro irrigation systems provide water to the plant roots through a complex pipe network and low discharge emitters. The water discharge pattern in these systems can be modified as per specific plant water requirements as several horticulture and agronomic plants have different requirements. The system components include pipes, low discharge water-emitting devices, tubes, flow control equipments, fitting and accessories. Growing population coupled with increasing food demand is presumed to aid the industry over the 2012-2022 period. Increasing industrialization and urbanization has reduced working population in farms. Such a trend has resulted in the wide acceptance of micro irrigation systems as these reduce labor and increase efficiency.

Reducing arable land over the recent past owing to factors such as industrialization, soil erosion, urbanization and deforestation has resulted in a shift in trend towards micro irrigation systems. Depleting water levels and water scarcity that is prevalent in many parts of the world are key drivers for this micro irrigation systems market over the forecast period. Micro irrigation systems result in increased crop yield and better quality product owing to high efficiency. Minimal soil erosion, low weed growth and easy fertigation & chemigation implementation are other added advantages. Such benefits are expected to play a significant role in shaping the micro irrigation systems market over the forecast period. Favorable regulatory framework and government policies that encourage such systems in order to reduce drought related problems are presumed to be major growth drivers over the forecast period. Governments particularly in the developing regions such as Asia Pacific and Latin America have taken numerous initiatives to promote such technology that offer better crop yield at a reduced cost.

However, high initial investment is anticipated to hinder the industry growth particularly in the developing regions as these are price sensitive markets with ample labor availability. High maintenance requirement is another key factor that is projected to hamper the global market in the near future. This industry lack proper monitoring agency and regulations that overlook product manufacturing operations resulting in product duplication. Such paucity in regulatory framework is expected to curtail industry growth in the near future.

Brisk demand especially in the emerging regions such as Asia Pacific, Middle East & Africa and Latin America are projected to offer ample growth opportunities to the industry participants. Government policies favoring such technologies are presumed to open up ample opportunities for market growth & development.

Major product types include sprinklers, drip, lateral move and central pivot. Sprinklers dominated the global market over the recent past are projected to continue this dominance over the forecast period at a CAGR of 17.1 percent from 2015 to 2022. However, drip irrigation systems are expected to witness the highest growth rates over the next seven years followed by sprinklers. Different sprinkler components include tubings, pumping unit, fittings/ sprinkler heads and couplers. Among these, tubing are expected to witness the fastest growth rate. Central pivot components include water emitter, pipelines, central towers and system control panels. Similarly, drip irrigation components include tubings, backflow preventors, valves, filters and pressure regulators.

"Micro irrigation systems result in increased crop yield and better quality product owing to high efficiency"

Micro irrigation systems can be segmented by different crop types such as plantation crops, orchard crops, field crops and forage & turf grasses. Among these several crop types, orchard crops dominated the global market followed by plantation crops and field crops. Field crops are expected to witness the highest growth rate followed by orchard crops and forage & grasses. Growing food demand owing to rising population especially in the developing regions such as Asia Pacific, Central & South America and Middle East & Africa is presumed to complement the regional as well as global market.

North America accounted for the largest share in the global market followed by Asia Pacific and Europe. Developing regions such as Asia Pacific, Middle East & Africa and Central & South America are projected to experience severe water scarcity in

Chart 1: North America micro irrigation systems market revenue by product, 2012-2022(USD)

the near future owing to growing water demand for domestic, commercial and industrial purposes. These regions are presumed to witness brisk demand for such technologies and are projected to be major demand centers. High prevalence in the developed regions and ample strong demand growth in the emerging regions offer ample opportunities for the industry participants. Favorable government policies in economies such as China and India are expected to play an important part in shaping the regional markets. ■

Grand View Research
Web: *www.grandviewresearch.com*

سجلت السوق العالمية لأنظمة الريّ الصغرى ٢,٤٨ مليار دولار أمريكي في العام ٢٠١٤ مع توقعات بأن تشهد نمواً سريعاً بسبب عوامل مثل النمو السكاني وزيادة الطلب على الغذاء. تُعتبر هذه الأنظمة أنظمة ضغط متوسطة ومنخفضة توفر المياه للكثير من التطبيقات كالرش والنضح والتقطير والردّ. توفّر أنظمة الري الصغرى المياه إلى جذور النباتات من خلال شبكة أنابيب معقدة وبواعث تفريغ منخفضة. كما يمكن تعديل نمط تصريف المياه في هذه النظم وفقا لمتطلبات المياه لنبتة محددة نظراً لأن الكثير من أعمال البستنة والنباتات الزراعية تملك متطلبات مختلفة. وتشمل مكونات نظام ما الأنابيب وأجهزة إنتاج وتفريغ المياه المنخفضة والصمامات ومعدات التحكم بالتدفق والتركيب والإكسسوارات. ومن المفترض أن يؤدي النمو السكاني إلى جانب زيادة الطلب على الغذاء إلى المساعدة في نمو هذه الصناعة للفترة الممتدة من ٢٠١٢ إلى ٢٠٢٢. كما ساهمت الصناعات والتحضر في تقليص عدد العاملين في المزارع، الأمر الذي أدى إلى إقبال واسع على استخدام نظم الري الصغيرة وذلك لتقليل العمل وزيادة الكفاءة. وتجدر الإشارة إلى أن نظم الريّ الصغيرة تؤدي إلى زيادة المحصول وتأمين جودة أفضل للمنتج نظراً لكفاءتها العالية.

Austrians Built World's Southernmost Irrigation Plant

Optimal irrigation knows no barriers. This is taken literally by the Austrian **Bauer Group** with headquarters in Voitsberg which will ensure from now on optimal irrigation by means of a pivot system in the faraway Chilean municipality of Primavera in Tierra del Fuego. The plant has been set up on the Chanarcillo farm in Primavera, eight kilometres from Cerro Sombrero. In addition to the Chilean minister of agriculture, *Carlos Furche* and the executive secretary of the national Commission on Irrigation, the official ceremony of putting into operation was also attended by the Bauer representative in Chile, *Felipe Donoso* and by the commercial attaché of the Austrian embassy, *Wolfgang Köstinger*. This center pivot meets highest European quality standards, with a length of 400 meters it has got seven drive towers and irrigates 50 ha. Operation needs 42 liters per second, a complete irrigation turn at a minimum precipitation level of 5 mm takes 16 hours. The required drive power amounts to 40 HP for the pump and additional 5.25 HP for the seven drive towers of the pivot. The irrigation plant is in constant and continuous operation, withstanding both "regular" wind speeds of 50 to 60 km/h and peak speeds of up to 184 km/h. The pivot is supplied with water from the Said river which comes to the land through a 7 km long channel built by the farm owner. ■

Bauer implementing irrigation plant in Chile

Irrigation Monitoring Using Soil Water Tension

WATERMARK sensors measure soil moisture status in centibars (cb) or kilopascals (kPa) of soil water tension. This value represents the energy a plant's root system uses to draw water from the soil. Interpreting the sensor readings gives a vivid picture of what is happening with the soil moisture in the crop's root system. Usually, 2 or 3 readings between irrigations are sufficient. Charting the readings will show exactly how quickly (or slowly) soil moisture is being depleted. Automatic data collection equipment, such as **IRROMETER Company**'s monitor, can also provide a graphical display of the data. Perhaps the most important soil moisture reading is the difference between today's reading and that of 3 to 5 days ago. That is to say, how quickly is the reading going up? A slow increase means the soil is drying out slowly. But a big jump means the soil is losing water rapidly. A faster rate or increase means the crop is beginning to work harder to extract water from the soil and may start to stress. By analyzing such trends in the readings, people will determine when to irrigate. Readings taken after an irrigation or rainfall event will show exactly how effective that water application was. The company has been in business since 1951, manufacturing soil moisture measuring, controlling, and sampling instruments used worldwide for scheduling irrigation. ■

Sensor in AG Roots

Anchor Allows Center Pivots to Irrigate More Land

In today's market, it is more important than ever for growers to make the most of all their cropland to get the highest possible yield. For many growers, this means irrigating land that may be difficult to reach with traditional center pivots. **Valmont® Irrigation**, the manufacturer of the Valley® brand of irrigation equipment, is expanding its Bender product line with a new anchor package that extends the reach of irrigation machines even further. Valley Bender products allow a center pivot to bend and wrap around in-field obstacles, irrigating the acres behind it. The new Bender Anchor allows growers to use Benders on longer machines and on rough or rolling terrain to irrigate even more hectares. Only Valmont Irrigation offers an anchor for its bending units because only Valley pivots have the strength to handle long Bender machines, said Valmont Irrigation Vice President of Global Marketing *Matt Ondrejko*. "Our studies found that growers can increase their profits just by irrigating more of the land they already have," Ondrejko said. "The new Bender Anchor extends those irrigated hectares at a low per-hectare cost, improving yield and profit." The company founded the center pivot irrigation industry in 1954, and the Valley® brand is the worldwide specialist in sales, service, quality and innovation. With historical sales of more than 200,000 center pivots and linears, Valmont-built equipment annually irrigates approximately 10 million hectares around the world. ■

Bender Anchor illustration

Industry-University Collaboration & Innovation

The extremely close water-energy-food link and interrelation underscored in the contribution presented by **Caprari**, together with the **Federico II University of Naples**, is a mantra of the past few years and was perfectly in line with the theme of EXPO Milano 2015, i.e. “Feeding the Planet, Energy for Life”. Energy saving certainly produces economic benefits, but the ethical and environmental sustainability implications are even more important. MASLOWATEN “MArket uptake of an innovative irrigation Solution based On LOw WATer-ENergy consumption”, the project coordinated by the **Polytechnic University of Madrid** and funded by the **European Commission** as part of HORIZON 2020, comes within this context. Caprari is committed to this important project together with other industrial groups and Universities. The aim is to build irrigation systems powered solely by self-produced photovoltaic energy in 5 sites located in Spain, Italy, Portugal and Morocco, and to save at least 30 percent of the water used at the present time: this requires meticulous research into crop requirements and accurate meteorological analyses. For many crops, the water used to irrigate them is the principal cost: if this cost were reduced, impoverished agricultural areas would become competitive, with important environmental implications. A society is mature when it manages its resources wisely, when it does all in its power to limit waste. Thus, it would be only proper to associate “Energy saving” with “Energy recovery”, since it is equally important owing to its social, environmental and economic overtones. When it comes to pumping in water supply grids, high pressures must sometimes be produced to reach distant, inaccessible users. In branches of the grid nearer to the pumping station these pressures are excessive and dangerous for the integrity of the grid itself, so they are lowered by pressure reducing valves. To avoid this waste of energy, a PaT (Pump as Turbine) can be installed instead of the pressure-reducing dissipating valve since it produces energy by means of a self-regulating system that generates power, thereby reducing the pressure. Caprari and Federico II University participated in another HORIZON 2020 project called SHINE “Smart Hydropower for Improved Network Efficiency”. Coordinated by **Trinity College**, Dublin, it is currently being assessed by the European Commission. The aim is to build ten energy recovery systems with PaT in different areas: industry, distribution of drinking water, agricultural irrigation and water treatment systems. The purpose of these two European projects is not to discover new products or new processes, but to create methods of use, provide data from real applications and disseminate the successful results obtained for the purpose of promoting and increasing these applications, thereby achieving the maximum possible energy savings and recovery. ■

MZT Pumpi Delivers Pumps to Iraq

MZT Pumpi Macedonia, specialized in production of industrial pumps for more than 70 years, has successfully produced and delivered three Double Inlet Split Casing for irrigation water to an engineering company in Iraq.

Double Inlet Split Casing Pump

The Three Double Inlet Split Casing Centrifugal Pumps type D 45-35-63, for transport of irrigation water, have the following characteristics: 1800 [m^3/h], 42[m], Pm=315 [kW], n=960 [rpm], U=6600 [V]. With experience of more than 70 years, strong workforce of 130 people, a department for research and development, and sales presence in over 30 countries, MZT Pumpi is a reliable global partner to many clients searching for pumping solutions. Its production facilities are located in the industrial suburb of the capital of Republic of Macedonia – Skopje. ■

Industry Spotlights

Engines, Generators & Compressors

Ozone & UV Systems

Submersible Pumps

Photo Courtesy of Mazzei

Saudi Arabia Diesel Gensets Market to **Surpass USD700 Million by 2020**

The market for diesel gensets in Saudi Arabia is growing at fast pace and is projected to cross USD700 million by 2020. Demand for diesel gensets in Saudi Arabia is anticipated to be driven by infrastructure, industrial, manufacturing, telecom as well as residential sectors. On the basis of their power ratings, diesel gensets are broadly segmented into four categories – Low Voltage (5KVA – 75KVA), Medium Voltage (75.1KVA – 350KVA), High Voltage (350.1KVA – 750KVA) and Very High Voltage (750.1KVA – 3000KVA).

Currently, mega projects worth USD2.5 trillion (including on-going projects worth USD1.4 trillion and other projects worth USD1.1 trillion in the early stages of development) are being executed in the Middle East and North Africa (MENA). Saudi Arabia accounts for nearly one third of the total value of these ongoing and upcoming projects in MENA. In 2014, residential, telecom and manufacturing were the leading end user segments, cumulatively accounting for a revenue share of more than 60 percent in Saudi Arabia diesel gensets market.

Over the next five years, very high voltage diesel gensets (750.1KVA – 3000KVA) market in Saudi Arabia is forecast to witness robust growth, due to increasing demand from manufacturing, oil & gas and commercial sectors. Power requirements in the petrochemical sector in Saudi Arabia are majorly being addressed through high voltage diesel gensets. High voltage diesel gensets are also anticipated to emerge as the leading segment in Saudi Arabia diesel gensets rental market during 2016 - 2020. The market for diesel gensets in Saudi Arabia is projected to grow at around 9 percent over the next five years. Around three fourth of the market share in the country's diesel gensets market is accounted for by the Eastern region and Northern & Central region. **Caterpillar**, **Cummins**, **Kirloskar** and **Saudi Diesel Company** are few of the major diesel genset manufacturers operating in Saudi Arabia. In 2014, petroleum accounted for a share of 57 percent in the total electricity generation in Saudi Arabia, followed by natural gas, solar and other renewable sources, which accounted for a 42 percent and 1 percent share, respectively, in the country's total electricity generation. However, the government is focusing on diversify to nuclear and solar energy for electricity generation, and thereby, reduce dependence on petroleum. Saudi Arabia is estimated to face electricity shortage of 1.8 billion kilowatt hour by 2016 and this is forecast to reach 16.14 billion kilowatt hour by 2020. This electricity shortage is anticipated to boost demand for diesel gensets in the country in the coming years. Rapid industrialization, massive investments in infrastructure sector, inadequate transmission and distribution infrastructure in remote areas and expansion of telecom sector are anticipated to propel growth in Saudi Arabia diesel gensets market through 2020. However, the major challenge restricting growth of diesel gensets market in Saudi Arabia include implementation of stringent environmental norms by the government for maintaining proper air quality levels across the Kingdom. ■

> *"High voltage diesel gensets are also anticipated to emerge as the leading segment in Saudi Arabia"*

Figure 1: Saudi Arabia Power Generation and Consumption, By Volume, 2010-2020F (Billion Kilowatt Hour)

Source: EIA & TechSci Research

TechSci Research
Web: www.techsciresearch.com

تشهد منطقة الشرق الأوسط وشمال أفريقيا حاليا تنفيذ مشاريع ضخمة بقيمة ٢,٥ تريليون أمريكي (بما في ذلك المشاريع الجارية بقيمة ١,٤ تريليون أمريكي ومشاريع أخرى بقيمة ١,١ تريليون أمريكي في المراحل الأولى من التطوير). وتستحوذ المملكة العربية السعودية على ما يقرب من ثلث القيمة الإجمالية لهذه المشاريع الجارية والقادمة في منطقة الشرق الأوسط وشمال أفريقيا. تنمو سوق مولدات الديزل في المملكة العربية السعودية بوتيرة سريعة مع توقعات بأن تتخطى ٧٠٠ مليون دولار أمريكي بحلول العام ٢٠٢٠. ومن المتوقع أن يكون الطلب على مولدات الديزل مدفوعاً بقطاعات البنية التحتية والصناعية والتصنيع والاتصالات وكذلك القطاعات السكنية. على أساس تصنيفات قوتهم، تتوزع مولدات الديزل بشكل عام على أربع فئات وهي توتّر منخفض (٥ إلى ٧٥ كيلو فولت أمبير) وتوتّر متوسط (٧٥,١ إلى ٣٥٠ كيلو فولت أمبير) وتوتّر عال (٣٥٠,١ إلى ٧٥٠ كيلو فولت أمبير) وتوتّر عال جداً (٧٥٠,١ إلى ٣٠٠٠ كيلو فولت أمبير).

Aussie Drought Buster Program

Aussie Pumps' range of Yanmar powered pumps provide excellent efficiencies

Aussie Pumps and **Yanmar** have jointly developed a range of pump that will help farmers to beat the drought. The product range includes high pressure pumps suitable for transferring water long distances as well as water harvesters to transfer water when creeks and rivers are in flood. Australian Pump is regarded as being the specialist in compact, efficient engine drive pumps for farmers, contractors and miners. The product range, originating as high pressure firefighting pumps for bush fire control, has grown over the last 20 years into one of the most comprehensive product lines of its type in the world. "In Australia we set out to help farmers deal with "fire and flood" situations", said Aussie Pumps Product Manager, *Brad Farrugia*. "This has driven us to develop products that are now exported all over the world". The company teamed up with Yanmar because of the extensive range of engines and the undoubted quality produced by this iconic Japanese company. Aussie Pump Yanmar powered products are thoroughly match tested, with pump design engineers working closely with Yanmar to guarantee that the pumps will provide first class performance and longevity in Australia's tough rural operating conditions. Drought generally drives farmers and contractors to cart water long distances so fast and efficient filling of tankers is imperative. Aussie Pumps' range of Yanmar powered pumps provide excellent efficiencies. The pumps can draft water from vertical depths as low as 8.4 meters, a record in terms of self-priming efficiencies. The diesel engines selected by the company are all from Yanmar's "L" series of high speed, air-cooled diesel engines. The Yanmars offer low fuel consumption, even when running at high speed. They are designed to operate at up to 3600 rpm, ideal for self-priming centrifugal pumps. For continuous operation, the manufacturer recommends running the pumps at 3,000 rpm. This saves fuel, reducing the fuel consumption to as little as .78 L/hour depending on load. ■

Subaru Grows Distributor Network

The EX21 engine & other models are now available from five new distributors

Subaru Industrial Power Products increased its distributor network with five new companies, expanding customer access to standalone engines and replacement parts in 13 states. The five new distributors offer sales and service support for customer needs to maintain Subaru engines on a wide range of machines including generators and outdoor power equipment, such as lawn and garden equipment. "To support our dedication to our dealers and customers, we've partnered with distributors who are well-known for their strong focus on customer service," said *David Frank*, Subaru Industrial Power Products vice president of sales and marketing. **Jerry Pate Turf & Irrigation** provides a variety of outdoor equipment for industries such as turf equipment dealers, golf courses and irrigation contractors from locations in Alabama, Florida, Georgia and Tennessee. **LL Johnson** serves the Rocky Mountain and Midwestern states with its five Denver locations and supports customers and dealers with a wide range of power equipment for the grounds maintenance and irrigation industries. **RBI Corporation** distributes outdoor power equipment in the Southeast and has warehouse locations in Florida, Georgia, Kentucky and Virginia. **Total Energy Systems** delivers power solutions to customers with generator sales and service and has locations in Wisconsin, Michigan, Minnesota and North Dakota. **Golden Eagle Distributing Corporation** offers a diverse selection of power lawn and garden products and has facilities in California and Illinois. ■

Flare Gas Converted into Electric Power Generation

Billions of cubic meters of natural gas are flared annually at oil production sites around the globe. Flaring gas wastes are a valuable energy resource that could be used to support economic growth and progress. It also contributes to climate change by releasing millions of tons of CO_2 to the atmosphere. Egypt is not an exception in flaring gas and is suffering from energy shortage; one of the solutions to minimize gas flaring is to treat it and make it affordable for gas power generation. **Professional Engineering Services (Proserve)** with its principles Dresser Rand "Guascor gen sets" has successfully installed a very unique 2 X 780 kW gas gen sets "Model SGLD480" using the flare gas at **Amapetco** company field in Ras Eldeb bay "100 Km south of Hurghada city. These two gen sets are the first environmentally friendly ones in Egypt using a catalytic convertor to reduce the NOx to less than 100 PPM. They also include an automatic fire suppression CO_2 system with gas leak, heat, flame and smoke detectors. The gas gen set units are state of the art technology with low compression ratio engine to cope with the low flare gas quality with built-in synchronizer and knocking detection system built in a 12 meter sound attenuation container. This successful project is going to reduce more than 70 MMSCFD of flare gas every year and reduce the emission of CO_2 with more than 5000 tons/year. ■

Proserve successfully installed gas gen sets at Amapetco

A Large UV System in Action for Secondary Effluent Disinfection

Metropolitan St. Louis Sewer District (MSD) in the State of Missouri has implemented Ultraviolet (UV) disinfection in its Lemay Wastewater Treatment Plant (WWTP) for disinfection of the plant discharge to Missouri River. The UV technology with low pressure high output amalgam lamps was adopted in order to minimize energy consumption for operation of the 240 mgd system. The UV equipment was selected via an evaluated bid process to fit into the regulatory mandated short time frame. Computational Fluid Dynamic (CFD) modeling tool was used to simulate hydraulic conditions in the multiple-channel UV system and hydraulic features were designed and installed based on the modeling results for optimal UV performance. The Lemay WWTP UV disinfection system has completed its two full (disinfection) seasons' operation, from April 1 to October 31, 2014 and 2015. The operation data has shown that the UV system is performing disinfection in meeting the regulatory requirements for discharge to the Missouri River. Abundant operation knowledge was collected and presented herein has been through the experience and effort of coping with the challenges, searching for and implementing the best solutions.

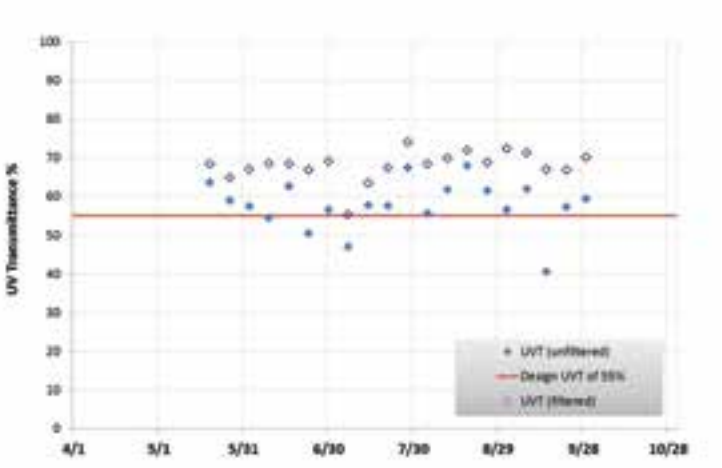
Introduction

The USEPA has promulgated the Missouri River dischargers to disinfect the plant effluent during the recreational season, from April 1 to October 31. The Metropolitan St. Louis Sewer District (MSD) is proactively engaged in the process for implementing effluent disinfection in order to comply with the NPDES permit requirement mandated by the USEPA. The Lemay WWTP is one of the large WWTPs owned and operated by MSD with peak wet weather flow to the plant up to 340 mgd and the secondary biological treatment capacity currently at 167 mgd. Construction of improvements to the secondary process is ongoing and the plant will have secondary capacity of a minimum of 210 mgd by December 2015. The disinfection facilities at the Lemay WWTP, will not only be capable of providing disinfection of the plant secondary effluent up to 240 mgd, but also providing adequate disinfection for the plant peak wet weather flow beyond 240 mgd during the disinfection season.

Various disinfection technologies were evaluated by using both economic and non-economic criteria, such as its environmental and social impacts to the service communities. Ultraviolet (UV) disinfection was the selected technology for the secondary treated effluent up to 240 mgd; and chlorination/dechlorination was selected for disinfection of the peak wet weather flow in excess of 240 mgd. The final discharge to the Missouri River is combined effluent from the two disinfection systems.

"Various disinfection technologies were evaluated by using both economic and non-economic criteria"

Figure 1: Lemay WWTP Secondary Effluent UVT during Disinfection Season



Establish robust design basis

After the decision was made to implement UV for secondary effluent disinfection, the water quality monitoring and dose response testing were performed focusing on collecting data to establish a robust UV design basis. The water quality monitoring included the key parameters, such as UV transmittance, total suspended solids and iron concentrations (TSS) concentrations from upstream secondary treatment processes; and the high TSS coincides with wet weather influents to the Lemay WWTP. High TSS or low UVT was mainly due to the secondary treatment process upsets during a storm event and/or algae bloom during the disinfection season at the final clarifier launders. UV system design based on the "worst" water quality often does not entail economic advantages in compared to upstream process modification, upgrade and/or operational optimization for improving water quality to downstream UV. Therefore, during the predesign, multiple upstream treatment process improvements were identified through the water quality monitoring for UV implementation. The improvements included the secondary clarifier launder covers, the wet weather flow diversion optimization at primaries and the control of iron salt usage for odor control.

that would have direct impact on UV system sizing, also the operation and maintenance (O&M) strategies after the installation. Figure 1 summarizes the UVT data collected throughout a disinfection season (April 1 to October 31). The occasional occurrences of low UVT coincide with high total suspended solids

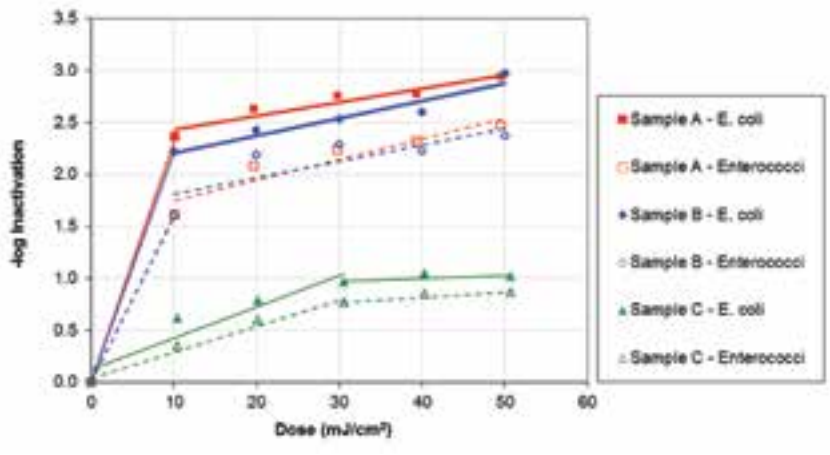
In order to establish the UV dose for system sizing, bench scale collimated beam tests (CBTs) were conducted on the secondary effluent samples from Lemay plant. The CBTs verified the UV doses required to achieve the pathogen reduction requirements targeting at a specific indicating microorganism. In anticipation of regulatory changes, multiple indicating microorganisms (Fecal coliform, E. coli and Enterococci) were tested. The design UV dose was determined based on the results from CBT performed on Lemay WWTP secondary effluent. It was discovered that UV dose requirements were different in terms of achieving the potential regulatory compliance level that would be required for each indicating microorganism. The CBT results have shown (Figure 2) that higher UV dose was required for Enterococci than E. coli to achieve the same log inactivation. During the design phase, the indicating organism for disinfection in Lemay WWTP NPDES permit was E. coli, however, in consideration of the potential regulatory change to Enterococci, the design UV dose was justified and a "compliance" factor was applied based on the testing results.

UV technology evaluation

Lamp technology and lamp configuration of UV disinfection systems vary among UV systems from UV equipment suppliers; and these result in substantial differences in terms of UV facility components, footprint, dimensions, and O&M requirements. The conventional design-bid-build approach involves multiple designs and bid documents; and consequently requires higher engineering cost and longer period time for design. The Lemay WWTP disinfection implementation was on the fast track due to the mandated regulatory compliance deadline of December 2013. In order to meet the regulatory deadline, a short-timeframe alternative approach was taken. The competitive pre-selection process was exercised using an "Evaluated Bid" approach.

"UV performance is highly dependent on how UV system is operated"

Figure 2: Lemay WWTP Secondary Effluent CBT Results (Courtesy of Suez environment, 2012)



Design for optimal UV performance

UV system performance is highly depending on the hydraulic condition through the UV equipment. Computational Fluid Dynamic (CFD) modeling was performed for the UV system design. Lemay UV system consists of five channels or reactors in parallel. Typically, UV equipment or disinfection capacity in each reactor is fixed at installation. Therefore, flow distribution to the each reactor is critical. The channel or reactor gets higher flow than others could potentially exceed the disinfection capacity of installed UV equipment. CFD Modeling scenarios were set for flow distribution to all channels and flow distribution to channels when one or two channels are taken out of service for maintenance. Based on the modeling outcome, UV system inlet structure configurations were modified; and hydraulic features, such as target baffles, vanes and weirs were provided to optimize the flow condition and to minimize potential uneven flow distribution under various flow scenarios.

Operation challenges & solutions

UV performance is highly dependent on how UV system is operated under varying flow and water quality conditions. The Lemay WWTP has experienced the two seasons (seven months each in 2014 and 2015) of operation. In addition to the performance data, operation knowledge was collected including a number of operational strategies that developed to tackle the challenges to ensure the optimal performance and compliance reliability. ■

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نفذت شركة(Metropolitan St. Louis Sewer District (MSD في ولاية ميسوري الأميركية تطهيراً بالأشعة فوق البنفسجية في محطة (Lemay) لمعالجة مياه الصرف الصحي من أجل تعقيم تصريف المصنع في نهر ميزوري. وقد تم اعتماد تكنولوجيا الأشعة فوق البنفسجية مع مصابيح ملغم العالية الإنتاج وذات الضغط المنخفض من أجل تقليل استهلاك الطاقة لتشغيل النظام الذي ينتج ٢٤٠ مليون جالون يومياً. تم اختيار معدات الأشعة فوق البنفسجية عن طريق عملية مناقصة تقييمية لتناسب الإطار الزمني القصير الإلزامي التنظيمي. وقد استُخدمت أداة تشكيل ديناميكا الموائع الحسابية (CFD) لمحاكاة الشروط الهيدروليكية في نظام الأشعة فوق البنفسجية المتعددة القنوات وتم تصميم الميزات الهيدروليكية وتثبيتها استناداً إلى نتائج التشكيل للأداء الأمثل للأشعة فوق البنفسجية. وقد أتمّ نظام التطهير بالأشعة فوق البنفسجية في محطة (Lemay) لمعالجة مياه الصرف الصحي عمليته لموسمين كاملين، من ١ نيسان/أبريل حتى ٣١ تشرين الأول/ أكتوبر ٢٠١٤ و٢٠١٥. وقد أظهرت البيانات العملية أن نظام الأشعة فوق البنفسجية يؤدي التطهير في تلبية المتطلبات التنظيمية للتصريف في نهر ميسوري. كما أن المعرفة العملية الوفيرة التي المجمعة والمقدمة هنا تمت من خلال الخبرة والجهد في التعامل مع التحديات والبحث عن أفضل الحلول وتنفيذها.

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Successful Exhaust Air Treatment in Waste Management Industry

Large exhaust airstreams contaminated with germs, mercaptans, amines and H_2S are produced especially in the waste management industry. An alternative method for treating exhaust air is the UV-C/ozone technology from **oxytec**. In the first instance, the method is based on the UV-C wavelength of light "cracking up" the stable carbon molecules with 185 nm and producing ozone with the wavelength of light from the oxygen part of the exhaust air at the same time. Owing to the instability and the high reactivity of ozone, the previously "cracked up" carbon molecules are oxidized. Water and minor amounts of CO_2 are left behind as residual products. The downstream catalyzer fundamentally serves the purpose of "repolishing" the treated waste airflow so that even organic peak loads can be eliminated without difficulty. The UV-C/ozone method displays significant advantages: The waste air is 99,9 percent germfree and the operating costs are low. The technology is particularly suitable under extreme weather conditions (heat) and variations of load. The UV-C/ozone technology is notably suitable for sewage plants for eliminating smells such as from digestion tanks, sedimentation tanks and closed rooms (e.g. sludge processing rooms etc.) contaminated with H_2S. The UV-C/ozone technology helped in reducing smells from 15.000 OU to less than 500 OU. The high H_2S values of ca. 100 ppm, which could not be effectively reduced with the scrubbers in the past, are no problem today. ■

The UV-C/ozone technology

Ozonation of Water & Wastewater Made Easier

Mazzei® offers complete Ozone Systems for rapid transfer of ozone gas into solution and subsequent removal of undissolved gases. In addition to color, taste and odor control that ozone treatment provides, the Mazzei systems have a small footprint, 95 percent or higher ozone transfer, low maintenance and they maintain system pressure. The Mazzei GDT™ Degas Separator is the best method for removal of entrained gas bubbles. Its unique compact design separates unwanted entrained gases – such as ozone, chlorine, or methane – and requires far less space than traditional gas separators. It enables gas separation with pressure differentials of 5 percent or lower and at variable flows. The self-cleaning design significantly reduces maintenance and downtime, and it includes no moving parts that can wear out, break down, or require service. Over-the counter and prescription drugs have become a serious threat to water systems. The Mazzei Pipeline Flash Reactor™ (PFR) contacting system is the solution to the problem of endocrine disrupting compounds (EDCs) —an efficient contacting system in a small footprint. The PFR utilizes high velocity mixing to transfer ozone sidestreams into bulk water flow, all within a compact footprint. With a PFR, ozone mass transfer occurs within seconds and eliminates the need for additional tanks or basins. When providing ozone for water purification, Mazzei's PFR uniformly distributes gas into the water and minimizes the size and cost of gas contacting. ■

Mazzei offers complete ozone systems

Environmental Benefits Lead DALROD Move into UV

Preparing the UV liner for insertion into the culvert

DALROD (UK) Ltd recently ventured into new Pipe-Lining territory using, for the first time, UV cured lining on a project for client **Peterborough City Council (PCC)**. The project known as Baxters Bridge was located near Newborough, a small hamlet and civil parish in the Peterborough district, in Cambridgeshire, UK. A crossroad near the village was a site where a deteriorated 600 mm diameter, under-road culvert required rehabilitation over a length of about 20 m. Inspection of the culvert by PCC showed that, due to its position with its crown at just 2 m below the road surface, the structural integrity of the concrete pipe construction was compromised by multiple fractures, cracks and other defects. Looking at the rehabilitation options meant selecting a lining technique that would 'fit the bill'. Given the experience of many contractors in the field of lining works, the project was put out to competitive tender. However, many lining options such as hot water cure and epoxy resin use do have significant leachate from the liner during the lining process and subsequent to the liner installation. The remaining option was the use of an Ultra Violet cured lining that does not have the environmental disadvantages of other systems. DALROD's Cambridge franchisee was selected as the preferred bidder for the works using a UV cure system. The whole lining operation was completed from arrival on site, through set-up, culvert cleaning, CCTV survey, lining and final survey in just one working day. ■

UV Innovation Applied for High Efficiency Water Reuse

The Honolulu Board of Water Supply maintains a water recycling plan driven by natural resource efficiency and land stewardship principles. In 2015, the Board upgraded the Honouliuli Water Reclamation Facility, the largest water recycling facility in Hawaii, treating providing 12 million gallons of recycled water per day. As part of the upgrade, the decision was made to replace an existing medium-pressure UV disinfection system with a **TrojanUVSigna**™. This resulted in significant advancements in energy efficiency and lower labor requirements for maintenance of the system. The new UV system utilizes high-intensity low-pressure high-output (LPHO) UV lamps each with a maximum energy draw of 1000 W. The use of high-intensity LPHO lamps is a growing trend in UV disinfection. Higher germicidal wattage per lamp and improved electrical efficiency over medium-pressure lamps allows the plant to meet its disinfection dose requirement and deliver treated recycled water with fewer LPHO lamps. The plant will realize a 16 percent decrease in total lamp count and a 78 percent drop in total installed power through the upgrade. As well, with fewer lamps, there is a corresponding reduction in operator maintenance for lamp replacement and stocking of parts. To ensure the plant maintains maximum UV system performance throughout its lifetime, the upgraded UV system was equipped with an innovative automatic chemical/mechanical sleeve cleaning system to remove any foulants from the sleeves – ensuring maximum UV output is delivered from the lamp into the water for disinfection. ■

TrojanUVSigna™

Solar-Powered Submersible Pumps: **An Economic Good**

*Water is a basic necessity of life. Be it for drinking, irrigation, livestock, or domestic use, there is nothing of such a crucial importance to human health and well-being. This puts water as one of the major issues in the **UN**'s Millennium Development Goals (MDG). Seven out of the eight MDGs rely on the water and sanitation target to be achieved, namely eradicating extreme poverty and hunger; achieving universal primary education; promoting gender equality and empowering women; reducing child mortality; improving maternal health; combating HIV, AIDS, malaria and other diseases; and ensuring environmental sustainability. Potable water is usually moved from sources at lower levels such as rivers, ponds, wells, and other ground sources to higher levels for irrigation, domestic use, and other needs. Whether being moved vertically from deep to surface levels, or horizontally from one location to another, water requires energy as a major component linked to water availability and consumption.*

Why solar pumping?

Of all the benefits solar energy has brought and keeps bringing to humans, none makes as much difference to humanity and people's daily lives as pumping water does. Through providing water for potable use, irrigation, and livestock, solar water pumping brings obvious benefits to rural areas and remote communities. Available abundantly and free, offering a financially feasible and technically practical solution, solar water pumping is becoming very common in agricultural applications to be regarded as an emerging solution providing water to disadvantaged and unfortunate communities. Using sophisticated yet well-established technologies, solar energy empowers a water pump that moves water from wells, ponds, and other water sources to ground levels and to end use locations. Thus, as long as the sun is shining, water is being pumped and moved around either to a water storage location or directly to consumers. This avoids the hassle of batteries for power storage that makes solar PV applications disfavored in many cases.


Cover Photo Courtesy of Layne Bowler

"… solar water pumping is becoming very common in agricultural applications"

Solar pumping is considered a more economically feasible solution due to the lower operating expenses (Opex) related to fuel supply and maintenance costs and reduced carbon footprint as compared to diesel generators. Tens of thousands of solar water pumps are in operation all over the world, meeting consumption needs especially in regions beyond power lines and producing best during sunny seasons when the demand on water reaches its peak.

Water pumping applications & technologies

Distribution of water through networks and in piping channels is driven by a properly designed pumping system that uses an electrically or mechanically driven pump to do the job. The pump is mainly used for dewatering purpose to reduce downtime from large rain events and to continuously transfer water from one point to another. There are two major types of water pumps currently available in the market; the first is the centrifugal pump, which uses a rotating impeller to move water into the pump and pressurize the discharge flow. Centrifugal pumps are able to pump fluids with various specifications regardless of the viscosity levels, but are specialized with thin liquids and high flow rates. Centrifugal pumps are used in buildings and fire protection for water supply. Also used in wells and boost applications for water supply and pressure boost.

The second is positive displacement pump (rotary pump) that delivers a fixed amount of flow through the use of a flexible diagram undergoing mechanical contraction and expansion. This kind of pump is perfect for high viscosity fluids, and specialized for low flow and high pressure combination. The fact that positive displacement pumps remove air from the lines and eliminate the need to bleed the air makes them very efficient.

Water pumping applications

There are tens of applications for water pumps, each requiring a different type of pump and a special design to perfectly meet the water pumping requirements. Different types of pumps currently exist, each for a specific use as reported by **ScoutHub, LLC**.

Submersible vs Surface

There are two major types of pumps used in water pumping, the selection process depends on the type of water source, the flow requirements, and the site conditions. Surface pumps are used in shallow wells ad surface water sources such as streams and ponds. It can only pump water from around 7 meters below ground level with

the ability to push far uphill but with a limited total dynamic head of 14 meters. Yet, to maintain pump efficiency and increase system reliability it is recommended to keep the suction lift to a minimum.

There are three main types of surface pumps:

(1) Delivery pump: Moves water from a location to another, at both high or low pressure

(2) Pressure pump: Pressurize small water systems in homes and small buildings

(3) Booster pump: Maintain pressure or flow for towns and communities

Surface pumps are less costly than submersible pumps, and offered at larger variety, but submersible pumps are mainly used for deeper wells although they are also suitable for surface applications.

A submersible pump is usually positioned inside the underground well, normally located more than 7 meters below ground level. Some pumps can go as deep as 450 meters below ground level, with high durability characteristics and ability to tolerate water with relatively high levels of salinity. Recent technologies are developing floating submersible pumps where the pump is positing in a floating unit on the surface of the water. There are two major categories of submersible pump, the most common is centrifugal used for low head and high water volume and the other is positive displacement including helical rotor pumps and diaphragm pumps used for high head and low volume.

Table 1: Types of submersible pumps and their operating characteristics

Pump Type	Head (m)	Flowrate (m^3/day)	Remarks
Centrifugal	0 to 80	6 to 20	Similar to conventional pump
Helical Rotor	50 to 150	>20	Robust; one turning part
Diaphragm	0 to 150	2 to 5	Complex; many moving parts; requires lubricants

The market in Lebanon

To date, Lebanon is not an oil-producing country, remaining with high dependence on foreign resources of fuel for electricity production. This gives renewable energy and especially solar an added value and presents it as a reliable solution contributing to increasing energy security in the country and reducing energy demand.

The largest renewable energy market in Lebanon is the solar water heaters market. A market that has been developing tremendously since the beginning of this century to be ranked among the most developed markets in the world by the International Energy Agency. The solar PV market is not as developed; it only started during the past couple of years after the **Ministry of Energy and Water** through the LCEC launched a green loan financing mechanism with the **Central Bank of Lebanon**. This financing option, called NEEREA, offers individuals or institutions interested in implementing a green initiative to benefit from long term loans with very low interest rates.

As NEEREA developed, the market started growing with several companies adding solar PV solutions to their scope of work and many others being established to offer this service. Yet, there is not much done in the solar pumping sector, and most installations performed are either in the residential or institutional fields being offered as an alternative power supply source to back-up generators.

"Recent technologies are developing floating submersible pumps where the pump is positing in a floating unit on the surface of the water"

There is a handful of solar pumping projects that we are aware of to be in operation in Lebanon, but there is a significant potential for the development of this sector, especially with the frequent fluctuation of fossil fuel price and the growth of water demand in rural regions where various agricultural activities are abundant. ■

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تعتبر المياه من الضرورات الأساسية للحياة. سواء تم استخدامها للشرب أو للري أو للأعمال المنزلية أو للثروة الحيوانية، لا يوجد شيء أهم من المياه بالنسبة لصحة الإنسان ورفاهه. كل ذلك يضع المياه بين القضايا الرئيسية على لائحة أهداف الأمم المتحدة الإنمائية للألفية. ويرتكز تحقيق سبعة من أصل ثمانية أهداف إنمائية للألفية على هدف قطاع المياه والصرف الصحي الذي يجب تحقيقه، وهي القضاء على الفقر المدقع والجوع وتحقيق التعليم الابتدائي الشامل وتعزيز المساواة بين الجنسين وتمكين المرأة وخفض وفيات الأطفال وتحسين صحة الأم ومكافحة فيروس نقص المناعة والإيدز والملاريا وغيرها من الأمراض وضمان الاستدامة البيئية. عادة ما يتم نقل مياه الشرب من منابع عند مستويات منخفضة مثل الأنهار والبرك والآبار وغيرها من المنابع الأرضية إلى مستويات أعلى ليتم استخدامها في الري والأعمال المنزلية وغيرها من الاحتياجات. وسواء تم نقلها بشكل عامودي من العمق إلى مستويات السطح أو بشكل أفقي من موقع إلى آخر، تتطلب المياه الطاقة باعتبارها عنصرا رئيسيا مرتبطا بتوافر المياه واستهلاكها. يتم عادةً وضع مضخة غاطسة داخل البئر تحت الأرض على عمق يزيد عن ٧ أمتار. ويمكن لبعض المضخات أن تصل إلى عمق ٤٥٠ مترا تحت مستوى سطح الأرض، مع خصائص متانة عالية وقدرة على تحمل المياه ذات المستويات العالية نسبياً من الملوحة. كما طورت التقنيات الحديثة مضخات غاطسة عائمة حيث توضع المضخة في وحدة عائمة على سطح المياه.

SAER Inaugurates New Technology Center

With the participation of more than 20 delegations coming from every Country in the world and with the attendance of the Mayor and several authorities, on December 1st **SAER Elettropompe** inaugurated the brand new Technology Center in Guastalla (Italy), dedicated to the training of personnel and distributors' technicians. The event falls on the eve of the 65th year of operation of SAER and the centenary of the birth of its founder, *Carlo Favella* who started a small engineering workshop in 1951 and now is a reality presents in over 100 countries worldwide. The company, always engaged in training activities, has conceived the new center as an area dedicated to the development and improvement of the skills of its employees, a strategy that has always seen as essential to offer a high quality product. The Company can boast a 100 percent production Made in Italy. Inside the new hub, in addition to the training center, there is an exhibition that displays the current range and the historical products as well, to demonstration of the profound evolution of SAER. The event was characterized by the presentation of new products such that will be available from 2016 as in line pumps, new 6" semi-axial submersible pumps series with 3 models to cover the actual 6" range with increased efficiency, a new range of horizontal and vertical multistage pump as well as "green" pumping solutions for operations through solar panels. The day ended with the contribution of European and Middle Eastern distributors who presented specific applications of SAER pumps in O&G, industrial, naval, mining and agricultural field. ■

Technology center

Xylem's Lowara Borehole Pumps Offer Advanced Water Solutions

The Lowara borehole pump range from **Xylem** offers advanced water supply solutions that can meet any requirement in residential, municipal, irrigation and industrial applications. The range features redesigned hydraulics and is compliant with the January 2015 update to the European Commission's Minimum Efficiency Index (MEI), part of the Eco Design Directive, where all pumps are required to record an MEI value of less than 0.4. The range is available in varying diameters from 4 to 12 inches, and consists of five different pump styles. The Lowara Z6 Series, designed for use in 6" wells, built of 304 and 316 (ZN6 version) stainless steel, featuring high sand handling capabilities, 100g/m^3, which make it suitable for use in harsh applications such as deep-well water extraction and for the irrigation of large areas, including golf courses. The Lowara Z8 series can be used in 8" wells and is built entirely of 304 stainless steel, whereas the Duplex version (ZR8) can also resist corrosion in even the most aggressive environments. The Lowara Z10-Z12 Series is a multistage vertical centrifugal pump for use in 10-inch and 12-inch wells. The shaft alignment of the pump is specifically designed to reduce vibration, ensuring high levels of efficiency, quieter operation and longer product life. Z10-12 series is built in 304 stainless steel or in duplex (ZR10-ZR12). ■


The Lowara Z12 pump

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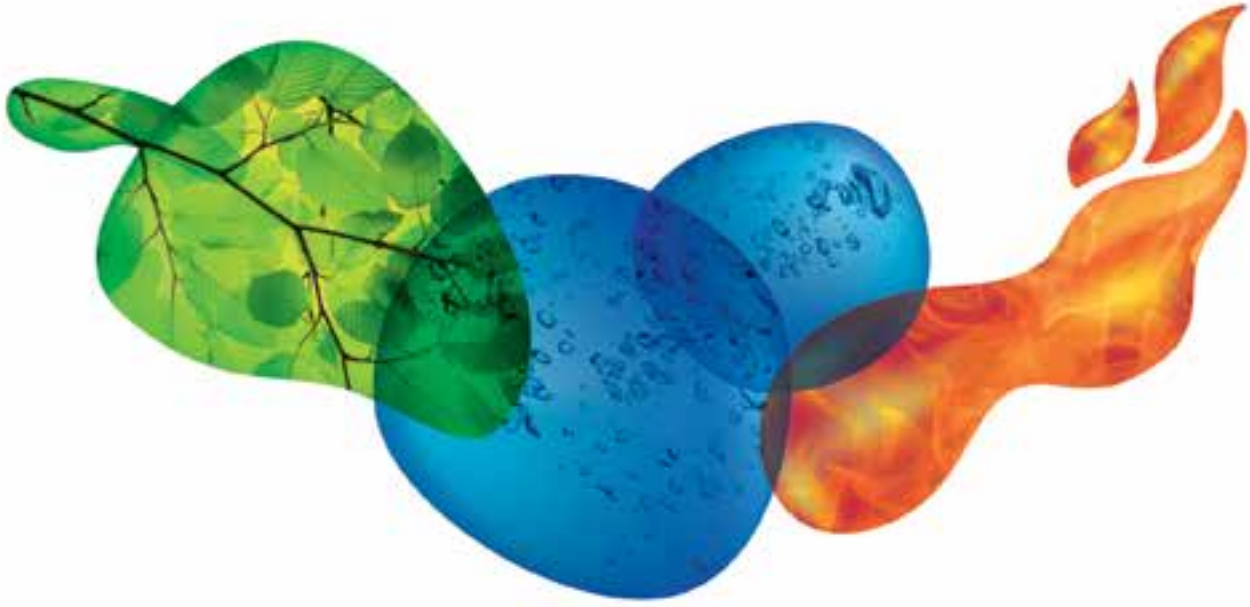

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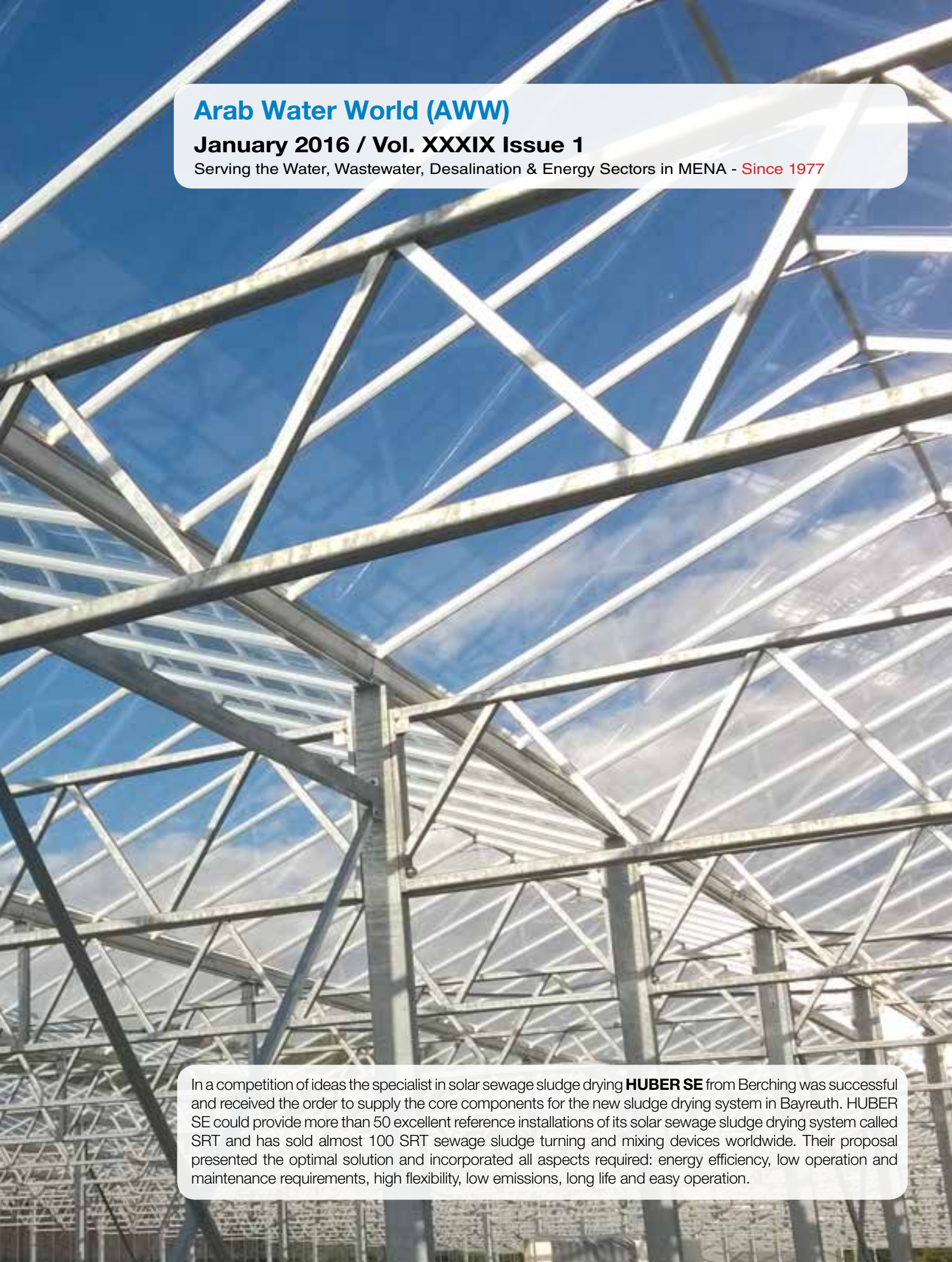
Serving the Water, Wastewater, Desalination & Energy Sectors in MENA - Since 1977



In a competition of ideas the specialist in solar sewage sludge drying **HUBER SE** from Berching was successful and received the order to supply the core components for the new sludge drying system in Bayreuth. HUBER SE could provide more than 50 excellent reference installations of its solar sewage sludge drying system called SRT and has sold almost 100 SRT sewage sludge turning and mixing devices worldwide. Their proposal presented the optimal solution and incorporated all aspects required: energy efficiency, low operation and maintenance requirements, high flexibility, low emissions, long life and easy operation.

Grindex: Pumps for Professionals

Grindex drainage sludge family

Grindex was founded in 1940 in Stockholm, Sweden, and has been manufacturing submersible electrical pumps since 1960. Today, the company has delivered over 400,000 pumps to more than 100 countries. Grindex has representatives in over 50 countries, and operations are quality certified as per ISO 9001 and environmentally certified as per ISO 14001. The company's products have proven their durable performance in a variety of challenging applications, including construction sites, mining, tunneling, power plants, rental, quarries, steel mills, rescue operations, industries and other areas where reliable and highly dependable pumps are required. Thanks to the built-in motor protection and the air valve, the pumps can run unsupervised for long periods, and even run dry for a length of time.

Drainage pumps
Grindex drainage pumps are used for pumping fluids with abrasive particles in applications like mining, construction sites and quarries. The pumps are equipped with an electronic motor surveillance and air valve that enables dry-running capabilities. The drainage pumps family range from 0.4 kW to 104 kW, have a maximum capacity of pumping up to 330 liters of water per second and lift water up to 230 meters.

Sludge pumps
The sludge pumps are used in numerous demanding applications for pumping fluids with solids up to the size of a tennis ball without clogging. The pumps are equipped with an electronic motor surveillance and air valve that enables dry-running capabilities. The sludge pumps family range from 0.9 kW to 6.6 kW, has a maximum capacity up to 28 liters of water per second and lift water up to 40 meters.

Slurry pumps
The slurry pumps in the Bravo-family are designed for pumping slurry and other fluids with high concentrations of abrasives, like sand and stones. The wear problem is solved by producing hydraulic components in Hard-Iron™, one of the hardest materials available today. Typical applications include dredging, cleaning of settling ponds, coal and ore slurries, Bentonite, coal washing water, sewage treatment plants, steel works, quarries, mines and many other industries. The Bravo pumps family range from 4.7 kW to 78 kW, have a maximum capacity of pumping up to 153 liters of water per second and lift water up to 57 meters.

Stainless steel pumps
Grindex Inox range of drainage and sludge pumps are constructed from stainless steel and are intended for use in demanding applications such as mines, process industries, fish farms, harbors and other environment which can quickly destroy conventional pumps. With its impressive allowed pH range, from 2 up to 10, it is hard to find an application that can't be handled by the Inox pumps. All materials in contact with the liquid are made out of AISI 316 stainless steel or better. The Inox pumps family range from 2 kW to 9.7 kW, have a maximum capacity of pumping up to 63 liters of water per second and lift water up to 75 meters.

Primo pumps
Grindex Primo pumps are ideal for construction, industrial and municipal jobs, and the highly compact design allows the Primo pumps to operate in dewatering applications where others don't fit. The Primo pumps family range from 0.4 kW to 0.75 kW, have a maximum capacity of pumping up to 6 liters of water per second and lift water up to 18 meters. ■

Tsurumi Submersible Heavy-Duty Agitator Pumps

Tsurumi Manufacturing has long been manufacturing, marketing and selling various pumps and related equipment, with a strong focus on submersible pumps. Introduced here are two series of heavy-duty, high-powered slurry pumps equipped with an agitator suited for the harsh conditions of large construction sites, mines, etc. The GPN-series offers motor outputs of 5.5 to 22 kW. The impeller, agitator and suction plate are made of high-chromium cast iron to ensure longer use against wear. And, if the impeller and suction plate wear down to the point of diminishing pump performance, the plate can be replaced or its gap from the impeller adjusted, giving users an easy and inexpensive means for ensuring extended use. The GSD is a new series of heavy-duty, high-powered agitator pumps. Driven by 37 to 75 kW motors, they feature the highest head and volume of Tsurumi's slurry pumps. The impeller, agitator and mouth ring are made of high-chromium cast iron to ensure longer use against wear. Moreover, performance drops due to wear have been minimized by pairing a closed impeller configuration with Tsurumi's unique mechanism that continuously adjusts the clearance between the mouth ring and impeller. Furthermore, pumps are equipped with seal pressure relief ports that release pump pressure applied to the mechanical seal, thus enhancing reliability in extended use. Both of these series come standard with anti-wicking cable entry and inside mechanical seals with silicon carbide faces. ■

The GPN pump

Country / Regional Reports

Germany

Iran

Saudi Arabia

Taiwan

Photo Courtesy of NWWC

German Water Sector: **On the Right Track**

Germany is very rich in water resources. In total, about a quarter of the available water resources are being used, and some 4 percent of that amount are used as drinking water. In order to lessen the demands on the water balance, Germans need to use water carefully. Using less water means, first and foremost, producing less waste water, but also saving energy in water supply and waste water treatment. Another aspect of sound water management is avoiding unnecessary pollution and contamination of water. The "consumption" of water, i.e. use of water, has been decreasing in Germany over the past ten years. Currently, the average consumption of drinking water is at around 120 liters per person and day, according to the ***Federal Ministry of the environment, Nature Conservation, Building and Nuclear Safety*** *in Germany. Compared to other industrialized countries, that figure is rather low. But there is still room for improvement.*

Groundwater makes up more than 70 percent of drinking water in Germany, which makes it the most important resource for drinking water. Apart from some regional exceptions, there are no problems regarding the amount of available groundwater. Water availability varies greatly, however, in the different regions of Germany. This is due to different volumes of precipitation, the amount of available groundwater or the existence of surface waters. Another key aspect is water demand, which is particularly high in conglomerations, according to governmental data. Furthermore, the improvement of water quality can be seen as the final hurdle in the advancement of the German water sector, according to **BMI Research**. Over 2014, the German construction industry has indeed shown signs that it is in the best shape it has been for over a year. Yet, in spite of this positivity, the water infrastructure project pipeline is expected to remain small. This is largely due to the well developed nature of the country's water sector. Overall investment levels remain muted and major projects will be subject to constrained budgets and strong opposition. Nonetheless some repair work and a moderate level of expansion, are anticipated particularly of the distribution and sewage networks, as low levels of domestic investment and ageing infrastructure do need to be addressed by the government and utilities.

"… the water infrastructure project pipeline is expected to remain small"

Besides, the European Commission estimates that droughts and water scarcities affect most European countries and cost some USD125 billion a year in damage and lost economic potential. These scarcities are largely a consequence of climate change, but a potentially far greater problem is peak water, the point when the natural limit of available fresh water has been reached and demand starts to outstrip supply. A long tradition in environmental technologies aligned with pioneering environmental policy and a supportive legislative framework has helped establish Germany as a leading market for green solutions, according to **Germany Trade & Invest**. The legislative framework drives market demand for advanced water technologies, new management tools, monitoring devices, automation and control systems, and new source control instruments. German water protection policy makes legal provisions for the maintenance of the quality of water bodies, an adequate supply of high-quality drinking and supply water, and the long-term securing of water for public use. Moreover, German companies are already capitalizing on their expertise in international markets. ■

Rasha Reslan
Editor & Researcher

تعتبر ألمانيا دولة غنية جداً في مجال الموارد المائية. ويتم استخدام حوالي ربع الموارد المائية المتاحة، كما يتم استهلاك نحو ٤ في المئة من هذه النسبة كمياه للشرب. ومن أجل تخفيف الطلب على المياه، يستخدم الألمان المياه بعناية. فاستخدام المياه بكمية أقل يعني، أولا وقبل كل شيء، إنتاج كميات أقل من مياه الصرف، الأمر الذي يوفر الطاقة لإمدادات المياه ولمعالجة مياه الصرف الصحي. أما الجانب الآخر من جوانب الإدارة السليمة فهو تجنّب حدوث تلوث مياه لا لزوم له. لذلك فإن نسبة «استهلاك» المياه قد تناقصت في ألمانيا على مدى السنوات العشر الماضية. حالياً، يبلغ متوسط استهلاك مياه الشرب حوالي ١٢٠ لتراً للفرد في اليوم الواحد وفقاً لأرقام صادرة عن وزارة ألمانيا الاتحادية للبيئة وحماية الطبيعة والبناء والسلامة النووية.

HUBER SE Provides Smart Plant Design

In a competition of ideas the specialist in solar sewage sludge drying **HUBER SE** from Berching was successful and received the order to supply the core components for the new sludge drying system in Bayreuth. HUBER SE could provide more than 50 excellent reference installations of its solar sewage sludge drying system called SRT and has sold almost 100 SRT sewage sludge turning & mixing devices worldwide. Their proposal presented the optimal solution and incorporated all aspects required: energy efficiency, low operation & maintenance requirements, high flexibility, low emissions, long life and easy operation. This convinced the plant owner who had indicated only minimum requirements in the tender documents and not allowed to deviate from those requirements. On its way through the plant the sludge passes a high performance dewatering unit and an automatic, for the most part redundant feeding system that distributes the sludge onto five drying lines within a 7.000 m² large greenhouse. The dried sewage sludge granule is transported into an automatic removal system and through a robust closed rapid loading system delivered onto transport vehicles. The HUBER SRT sludge turner is characterized for its excellent sludge bed treatment. With 1000 m³/h it offers the best and most efficient sludge mixing performance and thus avoiding the generation of anoxic zones within the sludge bed. The integrated sludge back-mixing function improves the sludge structure and makes even pasty and smelling sludge emission-poor and easy to treat mechanically. ■

Solar sewage sludge drying system

SEMIZENTRAL at German Sustainability Awards Research 2015

MICRODYN-NADIR is proud to be part of the innovative project SEMIZENTRAL which was awarded second best research project at the German Sustainability Awards Research 2015 in Duesseldorf. On Friday, November 27 2015, the award ceremony for the Sustainability Awards Research 2015 was held in Duesseldorf, Germany. The Technical University Darmstadt was awarded for the impressive and innovative project SEMIZENTRAL to be the second best research project with regards to sustainability in 2015. The project deals with contemporary problems and challenges, such as urbanization, world population growth and dynamics of urban growth as well as limited resources like water, energy and nutrients. Following the motto “wastewater is not a waste but a resource” Dr. *Peter Cornel* and his team at the **Technical University Darmstadt**, Germany developed an innovative and integrated approach. In line with this approach wastewater is seen as a resource for water, energy and nutrients. Conventional wastewater treatment plants do treat the wastewater but do not use the treasures it holds as the water streams are just discharged into the canals after treatment. With the right infrastructure solutions, resources can be treated and reused much more efficiently: instead of wastes, products like non-potable service water, irrigation water, biogas/electricity as well as biosolids can be produced out of wastewater. The project´s name already shows the solution: SEMIZENTRAL – not centralized nor decentralized but an in-between infrastructure solution that grows with the cities – might be the key to a sustainable future. The concept combines water and wastewater treatment with anaerobic sludge digestion. ■

First Resource Recovery Center in Qingdao

Krones Runs a Successful Business in MENA

Bottling machine

The **Krones Group**, headquartered in Neutraubling, Germany, plans, develops and manufactures machines and complete lines for the fields of process, filling and packaging technology. Its product portfolio is rounded off by information technology, factory planning and products from the company's subsidiaries as intralogistics, valve production etc. Every day, millions of bottles, cans, and special-shaped containers are handled on lines from Krones. Since being founded in 1951, Krones has evolved into an all-round vendor for its clients. Mechanical engineering, line expertise, process engineering, microbiology and information technology have here been harmoniously integrated for optimum synergies. Nowadays, the company is synonymous with holistic systems engineering – and **Integrated Packaging Systems IPS** is the link between Krones and the MENA region. Furthermore, the company's success is based on some few but crucial strategies: specialized knowledge of mechanical engineering and the customer sectors involved, a technical lead driven by continuingly high expenditure on research and development, backed up by worldwide 24/7 service support, and most especially by the skills of its highly motivated staff. In Iran, as well as worldwide, service engineers ensure the functionality of the customer's equipment. For 25 years Krones and IPS run business in the MENA countries. During this period, many successful projects have been performed together with the customers. For example in Iran with **Khoshgovar CO (CSD)**, **Alifard CO** and **Marina CO** (both are bottlers for fruit juices), or in the non-alcoholic beer sector Tehran **Govar** and **Arpanoosh**. ■

A Sociological Perspective of **Water Conditions in Iran**

Sociology, as a science of observing and projecting societies, will have a glance at Iran's needs for water to be able to grow products enough to feed its growing population. While above 50 percent of the country's provinces/states are facing droughts, agriculture is facing increasing challenges. The emerging scenario will create further migration-related problems including urbanization, slum-dwelling, marginalization, unemployment, wide range of socio-economic vulnerabilities and the like. Therefore, shortage of water which is a natural phenomenon is creating unprojected social, economic and environmental problems.

Discussion

Water-use efficiency needs to be increased in order to be able to manage the emerging atmosphere. Under the present circumstances, irrigation needs to be tackled more scientifically and reasonably. What is required, now, is a transformation from traditional mode of irrigation to new and industrial system of irrigation, to economize water-use. Moreover, Iran and many other developing countries are facing water stress and need recycling and reuse. For this purpose, countries need to build the necessary infrastructures and institutions with regard to socio-cultural norms and values. That is, a value system compatible with the current water situation. It is important to replace the traditional irrigation in agriculture with "Drip Irrigation" in order to economize the water use. Globally speaking, per capita irrigated area has declined by 5 percent since 1978, and new dam construction may allow only a 10- percent increase in water for irrigation over the next 30 years. Many countries in the Middle East and North Africa (MENA), and from China to India and Pakistan, either currently, or will soon fail to have adequate water to maintain per capita food production from irrigated land.

Sociologically speaking, the appearance competition for water as per nonagricultural uses, fisheries, industrial uses extensive urban water-use etc. previously used, mainly for agricultural purposes. All these increasingly threaten natural systems and drinking water too. Apart from agriculture, urban areas as generating power of growth are highly reliant on water and energy. Therefore, they highly impact energy and water. Determining decisions with regard to how water resources should be used are not merely made by the water managers, but they stem from the policies relevant to food security, industrial and economic development and public health, according to **United Nations** World Water Development reports. To produce different varieties of food materials and activate the sources of production, water and energy needs are of prime importance and priority. Therefore, from the perspective of sociology on environment, development of cities must be paralleled with water resources. However, many cities in Iran, which have physically developed in an unbalanced manner, are confronted with water challenges and limitations. However, if the relation between the urban physical development and water supply is not projected, it would lead to decline in quality of life. It must be notified that due to the cultural and health promotion within the citizens during the past decades, per capital water and energy consumption has increased in Iran. Similarly, pumping water from one part to another increases energy consumption in a city/country.

"Under the present circumstances, irrigation needs to be tackled more scientifically and reasonably"

While the two factors/resources of water and energy play the most important role in food production, agricultural productivity, industrial productivity and economic growth, substantial subsidies must be allocated to them. Many developing countries including Iran have been subject to two problems of population increase and migration in the past 60 years which have largely impacted water and energy. The emerging scenario needs new measures to be taken such as minimizing wastewater, change of consumption patterns, and change of methods in agricultural exploitation and multiple-use of water treasures.

In addition, people of all kinds need to change their norms and cultures in relation to water. While water and energy are limited with special reference to the present era, environmental sociologists are of the opinion that necessary cultural aspects of water consumption need to be transferred to the current people. However, access to cheap energy accompanied by digging and building of millions of private wells and pumping water in inappropriate systems of irrigation have contributed to excessive exploitation of underground waters not only in Iran, but in other developing countries too, according to the **World Bank**.

Increasing demand

Unprecedented demand for water, energy and food indicates threats for both public and private sectors, and ecosystems as well. Nonetheless, the situation is causing new discoveries and innovations. Modern times is witnessing ever-increasing demand for water and energy by the urban citizens for domestic, industrial and other purposes in addition to agricultural demands. Under such circumstances, the planning bodies/ organizations should regularly have supervision on these precious resources, i.e. they should be on the agenda of the government. In this way, the safety and security of the ecosystems could be accomplished too.

Medical recommendations to use more vegetables and agricultural products, in recent years, have intensified the demand for water in agricultural, industrial and domestic sectors. Therefore, the consumption chain is constantly increasing. The whole trend demands more water than ever before. At the same time, global warming and deforestation are occurring too. It is worth notifying that the chain of production and supply of food materials consumes about 30 percent of the total world energy consumption, according to **FAO**. The scenario of water shortage results in shortage of food and increasing prices followed by a situation in which many people and families cannot afford to buy their daily basic food items. While estimates currently indicate that, according to FAO, 870 million people are suffering from shortage of food and malnutrition, the number will increase by 2050; when the world population will rise to 9.3 billion, as stated by **UNDESA**. So, this is a part of the image of water shortage in the world from which Iran cannot be excluded.

"Any failure to secure adequate water and energy would result in […] severe environmental problems"

Conclusion

As lifestyles are inevitably changing followed by change in food and water consumption patterns, both urban and rural lives must find their priorities. Similarly, water and energy can guarantee the human safety and economic power, not only in Iran, but in other developing countries as well. Any failure to secure adequate water and energy would result in emerging challenges, socio-economic vulnerabilities and severe environmental problems. ■

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سيقوم علم الإجتماع بتسليط الضوء على احتياجات إيران للمياه لتكون قادرة على إنتاج منتجات تكفي لإطعام عدد السكان المتزايد. يقوم أستاذ علم الإجتماع الدكتور (محمد تقي شيخي) في قسم العلوم الاجتماعية في جامعة الزهراء في طهران في المقال أعلاه بالتطرق إلى التحديات التي تواجهها إيران. وإذ يواجه أكثر من ٥٠ في المئة من المحافظات في البلاد الجفاف، تواجه الزراعة تحديات متزايدة. سيخلق السيناريو الحالي مزيداً من المشاكل المتعلقة بالهجرة بما في ذلك التحضر والأحياء السكنية والتهميش والبطالة ومجموعة واسعة من نقاط الضعف الاقتصادي والاجتماعي وما شابه ذلك. لذلك، يخلق نقص المياه مشاكل اجتماعية واقتصادية وبيئية ليست في الحسبان. يجب رفع احتياجات كفاءة استخدام المياه من أجل أن تكون البلاد قادرة على إدارة الوضع الحالي. وفي ظل الظروف الراهنة، يجب معالجة الري بطريقة أكثر علمية ومعقولة. فالمطلوب الآن هو التحول من النمط التقليدي للريّ إلى نظام جديد وصناعي من أجل الاقتصاد في استخدام الري. وعلاوة على ذلك، تواجه إيران والكثير من الدول النامية الأخرى إجهادا مائيا وتحتاج إلى إعادة التدوير وإعادة الاستخدام. لهذا الغرض، تحتاج البلاد إلى بناء البنى التحتية والمؤسسات اللازمة المتعلقة بالمعايير والقيم الاجتماعية والثقافية.

Iran Takes Extensive Groundwater Management Plan

Smart energy and water meter

According to the **Electricity and Water Ministry of Iran**, limited access to water resources increased the water stress and risk of drought in the country. The persistence of the critical situation placed additional pressure on groundwater as major resources. In this regard and during the past decade due to over-pumping, there is 40 percent drop in aquifers' level and water tables in the country. As such, by considering various challenges faced by groundwater resources, the ministry of electricity and water in cooperation with ministry of agriculture designed "rehabilitation and rebalancing of groundwater resources" plan with the highest priority to implement comprehensive management of aquifers and rehabilitate resources. The plan incorporates 15 enormous, national size projects. The most important section of this plan is installation of 360,000 Smart Energy and Water Meters (SEWM) on all electrical water wells. The decision to select SEWM was made due to successful experiences and promising results after installing 60K SEWMs across the country. Even the project implemented in Esfarayen plain in Northern Khorasan province received **International Water Association's (IWA)** innovation award for the Small Projects Category in 2014. It is expected that by installing 360,000 SEWMs and providing communication platform for monitoring and managing water withdrawals from wells, 50 percent of the whole plan will be achieved. Other major projects under "rehabilitation and rebalancing plan" includes as the following: Digging piezo-metric wells and equipping with measurement tools and connect to online databases, opening water markets across the country and acquiring inefficient wells by the ministry. ■

Byrnelooby Sets its Sights on Iran

Iran's economy is set to open up to the global market after the historic deal on the 14th July in Vienna. This provides real opportunity in certain sectors, particularly in water and waste management. Although early days **ByrneLooby** have set their sights on potential engineering opportunities in Iran. In September ByrneLooby's *Michael Looby*, Joint Managing Director and *Sam Murdock*, Director of Water Services attended a Trade Mission facilitated by the **Middle East Association (MEA)**, in conjunction with M-Power Enterprises. The mission proved very insightful into the current engineering capabilities in Iran and potential future projects for the consulting engineers. The mission centered on the 11th Annual Iran Water & Wastewater Exhibition (Watex) which provided ByrneLooby with unique networking opportunities. *Sam Murdock*, Director of Water Services commented "Iran is a large country, with strong demographics, low debt and oil in the ground resulting in countless development opportunities. Iran is opening up to foreign investment and it is starting to re-connect with the rest of the world. If Iran continues down this road it could prove to be one of the most attractive investment opportunities of the next two decades." Murdock went on to state "having met the Minister for Energy, who has responsibility for water, he told me that they welcome all the assistance the West can provide so they may develop this important infrastructure sector." Murdock along with the other members of the delegation then had a more detailed meeting with the Minister's advisors on the water and drainage investment program for Iran. Furthermore, ByrneLooby have strong capability in the water and waste management area and are ready to take advantage of these opportunities. ■

BYRNELOOBY

HANYCO Promises Customer Satisfaction

Hamoun Nyzeh Company, (HANYCO) was established in May 2007 to be a supplying source to the growing demand of domestic and regional markets for Ductile Iron Pipe, premeditated to have an annual capacity of 70 thousand metric tons. Construction operation of the plant started in the same year with the investment of private sector and the test production process successfully took place within about 2 years. The production line with a DN range of 80-700 mm was fully and perfectly operational 3 months later. Anti-Sulphate cement in accordance with ISO 4179 and metal Zinc together with bitumen-based paint according to ISO8179-1 are respectively applied to the inner and outer surfaces of the pipes for best protection. Pipes are of push-on joint type and are sealed by EPDM gaskets which are produced in accordance with ISO 4633. Furthermore, Hanyco welcomes customers' requirements and demands. Ductile Iron pipe can withstand severe crushing loads. The ring test determines a pipe's ability to withstand load over a relatively small area, as would occur in rocky terrain where the pressure of a single rock, plus all the backfill above it, could cause weaker materials to fail. A deflection gauge on the ring-crushing apparatus has been adjusted to accurately record deflection at specified load intervals. Besides, pipes manufactured by HANYCO are centrifugally cast. In centrifugal casting, a permanent mold is rotated about its axis at high speeds (300 to 3000 rpm) as the molten metal is poured. ■


Ductile Iron Pipes

Farassan Celebrates 30 Years of Excellence

This year **Farassan** celebrates its 30th anniversary of establishment. Starting with manufacturing FRP fan blades in early years, the company is one of the biggest GRP pipe manufacturers in the world. With the support of **FARATEC** technology center, one of the biggest Technology centers in the world working on GRP pipes, now Farassan and other manufacturers licensed by FARATEC, can offer a "basket of products" for almost any application in piping. The "basket" includes: Uni-Axial, Bi-Axial, Pipejack, Petroleum Products Transfer, Fire retardant, Abrasion/Erosion resistant and PVC/PVDF-FRP pipes. Recognized as an approved pipe laying contractor in Iran, the company has been organizing JVs with consultant engineers companies and has entered BOT projects in Iran. So far more than 7,000 km of FARATEC pipes are in service all around the world and Farassan has started a new era of its activities involving EPCC, BOT projects. ■


Uniaxial - Pipe

Wahang Saran & TEW GmbH Join Forces

Amid the war in Iraq, attention to environment is a priority for the Iraqi Authority and especially Governor of Basrah. **TEW GmbH**, an Austrian company, and its partner **Wahang Saran** (Iran) jointly executed a sewage treatment plant of Al-theghar Town, 90Km north of Basrah city successfully. This plant has been in operation since March 2015. This plant, which is very compact and robust, consists of a main pump station, automatic screening system, oil removal and Pista type Grit chamber, aeration unit in three sectors for BOD removal, denitrification process and settling tank in circular design. The effluent is disinfected by channel mounted UV, which is one of the best technologies for disinfection of treated sewage. The entire plant is controlled by PLC and SCADA System. ■


Sewage treatment plant

Sustainable Plans
Strengthen Water Security Outlook

Saudi Arabia, known to have one of the highest per capita water consumption rates in the world, is dodging the unfolding water crisis that could have profound implications on its citizens. The extensive withdrawal of water from fossil aquifers is threatening the security of Saudi Arabia's non-renewable water resources, according to ***Future Directions International****. Data from* ***NASA****'s GRACE satellite mission indicates that the Arabian Aquifer (underlying Saudi Arabia and other Gulf States) has one of the highest rates of depletion, particularly from agricultural usage. In consequence, the country has been developing extensive desalination facilities. However, desalination is an expensive and energy intensive process. As a matter of fact, according to a report by* ***MIT Technology Review****, the country uses 1.5 million barrels of oil per day on water desalination.*

Solar desalination

One of Saudi Arabia's long-term goals is to implement renewable energy-powered desalination plants. Electricity demand in the country is growing 8 percent per year and peak demand is expected to be 70 GWe by 2020 and 120 GWe by 2032, driven partly by desalination increase, according to the World Nuclear Association. The high costs and energy consumption associated with the desalination process have created a scenario where Saudi Arabia's desalination capacity, and therefore water security, is closely linked to the stability of its oil supply, reveals Future Direction's report. Placing greater emphasis on minimizing environmental impacts in addition to saving energy has been receiving increased attention in Saudi Arabia. To illustrate, the **World Nuclear Association** reveals that the first of three phases of the King Abdullah Solar water initiative were expected to be operating by the end of 2013. Phase 1 involves construction of two solar plants which will generate 10 MW of power for a 30,000 m^3/d reverse-osmosis (RO) desalination plant at Al Khafji, near the Kuwait border. Phase 2 will involve construction of a 300,000 m^3/d desalination plant over three years. The third phase aims to implement the solar water initiative throughout Saudi Arabia, with the eventual target of seeing all the country's desalination plants powered by solar energy by 2020.

"Saudi Arabia has set targets that will increase reuse capacity by 91 percent to 8.8 million m^3/d"

Wastewater reuse

In the meantime, Saudi Arabia is shifting most of its attention toward recycling wastewater in the hope of reducing energy and financial burden on desalination plants. Central to government initiatives, in the Gulf Cooperation Council (GCC) region, is increased utilization of wastewater reuse systems that currently represent 4.6 million m^3/d of installed capacity, according to a new report by **Bluefield Research**. Saudi Arabia has set targets that will increase reuse capacity by 91 percent to 8.8 million m^3/d. The report states that this reclaimed water will be allocated to irrigation, landscaping, and industrial uses that would otherwise draw from more valuable groundwater and desalinated water supplies. **Global Water Intelligence (GWI)** reports that water reuse will increase at a compound annual growth rate of 4 percent from 2,367 million cubic meters per day to 5,834 million cubic meters per day in 2035. Moreover, the **National Water Company** is currently developing a plan to privatize wastewater, and plans to use almost half of recycled water in urban areas for domestic purposes, reports Future Directions. This development represents a significant improvement in current wastewater usage and strengthens Saudi Arabia's current water security outlook. ■

Dana Hani
Assistant Editor & Researcher

تملك المملكة العربية السعودية أحد أعلى معدلات استهلاك المياه للفرد في العالم وهي تسعى إلى تفادي أزمة المياه التي يمكن أن ترتب آثارا كبيرة على مواطنيها. وأشار تقرير صادر عن (Future Directions International) أن عملية سحب المياه الواسعة النطاق من طبقات المياه الجوفية الأحفورية تهدد أمن الموارد المائية غير المتجددة في السعودية. وتشير بيانات من مهمة القمر الصناعي لتغطية حقل الجاذبية واختبار المناخ (GRACE) التابعة لناسا أن المياه الجوفية في الدول العربية من ضمنها السعودية ودول الخليج الأخرى تشكل أحد أعلى معدلات النضوب ولا سيما نتيجة للاستخدام الزراعي. ونتيجة لذلك، تقوم السعودية بتطوير مرافق تحلية للمياه بشكل واسع النطاق. ومع ذلك، تُعتبر عملية تحلية المياه مكلفة وتستخدم طاقة مكثفة. في الواقع، تستخدم البلاد ١,٥ مليون برميل من النفط يومياً في تحلية المياه وذلك وفقاً لتقرير صادر عن (MIT Technology Review).

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The Pump People

NWWC Participates in Several Platforms


NWWC stand at an event

NWWC is considered one of the specialists in water works, pumping solutions in Saudi Arabia. The company serves its customer through a highly qualified staff of Engineers. It also believes that its duty towards the clients to facilitate through its expertise like Consulting Services, Engineering, Supply & Installation, Control & Automation, Testing & Commissioning and through its 12 worldwide partners manufactures. From 2016 and onwards, NWWC will focus on Alternative Power and Energy saving technologies. The efficiency is the objective of NWWC to save energy. Pumps being a serious integrated part of water solutions, the company has an ambitious plan of working with all those International leaders of water and waste water industry. **ANDRITZ** is one of the specialists of best optimum power solutions to save energy and have long life duration. Apart from Pumps, Valves are one of the milestone to contribute on the formula of saving energy. So **Talis** and NWWC have a full cooperation to enhance this technology within their joined activities in Saudi Market. NWWC is participating in most of the international and regional events to explore and expand the image of development of not only long life, durable water pumping solutions, but also energy efficient solutions at the same time. Now the company has gained serious projects of water pumps field due to high efficiencies of its solutions. On the other hand, NWWC will very soon open the state of art pumping test bed station in the new operation Center in Riyadh. ■

TMME: Doing Good

Toray Industries, Inc (Toray), one of the specialist suppliers in water treatment industry with full membrane line up(UF, RO, MBR), has established new company called **Toray Membrane Middle East (TMME)** at Dammam, Saudi Arabia in year 2014. TMME is the joint venture between Toray Industries, Inc. and **Abunayyan Holding Co (AHC)**, which has strong local basis in water treatment business field, and has state of art facility to manufacture RO membrane element to supply its product to GCC countries. TMME is the first spiral wound RO membrane manufacturing facility in GCC and establishment of such manufacturing base in Dammam surely reinforces the solid relationship with Saudi Arabia. Since 1990's, Toray has contributed to supply its membrane to water treatment plants in Saudi Arabia especially with SeaWater desalination application such as Shuaibah 3 Expansion. Furthermore, the company inherits such territorial reference and takes responsibility to cooperate with its customer to optimize long term low energy operation of desalination plant. One of TMME specialties is its advanced autopsy facility for returned RO elements from operating plant. This facility allows comprehending the RO element plant performance after the use and support to derive the optimization of plant operation. The company has talented team in Dammam 3rd industries to support the variety of requests from customer as their reliable partner. The company will continue to contribute to the society for supporting the establishment of sustainable water resource. ■

TMME Factory

Taiwan Undertakes Water Reuse
In the Face of Drought

Taiwan is experiencing record low rainfall and is facing its worst drought in decades. The country's poor water conservation record has obliged the government to introduce drastic water rationing measures. Experts stated that the government has reduced the water supply by up to 10 percent for heavy industrial users that consume at least 1,000 metric tons of water each month. Moreover, as a result of economic development, population growth and the increasing costs of exploiting new water sources, such as the building of dams, Taiwan's problem of water shortage will only go from bad to worse in the future, according to ***Taiwan Water Corporation (TWC)****. In the meantime, the country is adopting water-saving measures, mainly by implementing water and wastewater recycling projects.*

Planned projects

To help Taiwan deal with increases in water consumption as a result of drought and population growth, plans are in place to build an undersea pipeline and reuse water and wastewater from various treatment plants. The implementation of a differentiated water tariff system for domestic users across much of the country poses significant advantages over the longer term for the main water services operators, asserts a **BMI Research** report. China and Taiwan signed a deal on July 20, 2015 to pump water from the province of Fujian in mainland China to Taiwan's Kinmen County, in a sign of a thaw in relations between the two countries, reports BMI. Under the terms of the agreement, an 11.5km undersea pipeline will be built from Fujian to transport water to the 100,000 residents of the Kinmen archipelago by 2017. The pipeline will be able to deliver up to 34,000 tons of water daily to the archipelago by 2027. Furthermore, In September 2015, the Sewerage System Division of Kaohsiung City, Taiwan, announced a project tender to reclaim effluent from the Fengshanxi municipal wastewater treatment plant (WWTP), according to a **Bluefield Research** report. Through a public-private partnership agreement (PPP), Kaohsiung City aims to add 70,000 m^3/day of reuse capacity in two phases through 2019, for a total investment of USD81 million. In like manner, according to government sources, USD131.9 million is expected to be invested to set up the Futian Water Recycling Plant pre-treatment. The Bluefield report goes on to say that both Fengshanxi and Futain water recycling plants form part of Taiwan's broader water reuse plan to tap six of its 41 municipal wastewater treatment plants to supply neighboring industrial park demand. The government has budgeted USD465 million for all six projects to reclaim 280,000 m^3/day of municipal wastewater effluent.

"Fengshanxi and Futain water recycling plants form part of Taiwan's broader water reuse plan"

Impending threat

Taiwan's unresolved political issues are threatening goal achievements. Given that the government will be a key driver of infrastructure project implementation as well as financing over the coming years, the uncertain political outlook for Taiwan in light of the presidential elections coming up in 2016 is a key risk to BMI Research's outlook for the current infrastructure improvements in the pipeline for the water sector. According to the market research company, although agreements have now been signed to build an undersea pipeline from China to Taiwan, any change to pro-China political sentiment could result in the delay or even cancellation of the proposed pipeline. ■

Dana Hani
Assistant Editor & Researcher

تشهد تايوان انخفاضا قياسيا في هطول الأمطار وتواجه البلاد أسوأ موجة جفاف منذ عقود. وقد أجبر سجل البلاد السيء في المحافظة على المياه الحكومة على اتخاذ تدابير جذرية لترشيد المياه. وذكر الخبراء أن الحكومة قد خفضت إمدادات المياه بنسبة تصل إلى ١٠ في المئة للمستخدمين الصناعيين الكبار الذين يستهلكون ما لا يقل عن ١٠٠٠ طن متري من المياه كل شهر. وعلاوة على ذلك، ستتفاقم أزمة نقص المياه في البلاد حيث ستتدهور من سيء إلى أسوأ نتيجة للتنمية الإقتصادية والنمو السكاني بالإضافة إلى تزايد تكاليف استغلال مصادر جديدة للمياه مثل بناء السدود، وفقاً لتقرير صادر عن شركة (Taiwan Water Corporation). وفي هذه الأثناء، تقوم الدولة باعتماد تدابير لتوفير المياه من خلال تنفيذ مشاريع مياه ومعالجة مياه الصرف الصحي. من الناحية السلبية، تهدد القضايا السياسية العالقة في تايوان تحقيق أهاف البلاد.

AECL Ensures Reliability of Products

AECL has engaged in developing and producing industrial instruments for many years. The company started ODM business with **Honeywell** Taiwan since 2007. Committed to core policies, AECL keeps working on developing state-of-the-art technology and product research to ensure the reliability of its products. BTU meter and calculator is applied to calculate the energy consumption in HVAC system. The value can be used for energy management or for billing system. The complete system includes one flow sensor, two PT 500 temperature sensors and the most important, one BTU meter and calculator. Another product, water leak alarm, is CE approved. The leakage detection works with detecting cable which can be flexibly adjusted as well as the sensitivity, according to application. It can be applied in various places such as computer room, server room, data center, factory, office or the bottom of machines, etc. In addition to the alarm signal output, it provides simultaneously LED alarm indicator and siren for leakage warning. Not only can it be connected to intelligence building management system, but it can also be a stand-alone device. Furthermore, foreseeing the potential of environmental management, AECL has started developing a series of temperature and humidity transmitters, energy meters and CO_2 transmitters, air quality display. AECL continues to stringent quality control to ensure the reliability of products. TUV ISO 9001 certification and CE certifications for the company's series of industrial products are guarantees to customers of quality and reliability. ■

Water leak alarm

Titanium Pressure Reducing Valve Hits the Market

Z-Tide Titanium Pressure Reducing Valve from **Elite Line Industrial Corp.** is new in the valve market and suitable for desalination and off-shore systems. Similar to Titanium PRV in structure, SS316 Direct- Activated Pressure Reducing Valve with piston design is more demanded for various applications including wastewater, sea water, potable water, chemicals, HVAC, food and beverage, oil and gas, pump station and steam. In addition, Z-Tide multi-function auto-control valves have block-mounted pilots without external tubing that makes the valves easy to install and tamperproof. Compact light cylinder design and straight flow path inside the body give the valves 20 percent more capacity than competitive products. The large flow can reduce malfunctions caused by impure water and effectively decrease turbulence. Pressure drop capability of Z-Tide valves is 6 to 1 ratio without cavitation and this is unique in the industry where competitive products can handle only 3 to 1 or 4 to 1 ratio. Diaphragm type Water Hammer Arrester is another featured product of Z-Tide with patent. Unlike traditional piston type water hammer arrester, Z-Tide diaphragm type Water Hammer Arrester has airbag with ballpressing- type design which absorbs water hammer effect directly and quickly. Less friction and function progresses enable a longer life for the arrester. The company's new line, UL Listed Pressure Reducing Valve was approved by Middle East Fire Department in 2015. ■

Pressure reducing valve

Departments

Corporate Happenings

Products & Services

Projects & Developments

Photo Courtesy of Ham Baker

DEWA Signs MoU with Kallman Worldwide

Saeed Mohammed Al Tayer, MD & CEO, **Dubai Electricity and Water Authority (DEWA)**, President and Founder of Water, Energy, Technology, and Environment Exhibition (WETEX 2016), recently signed a memorandum of understanding (MoU) with *Tom Kallman*, President and CEO of **Kallman Worldwide**, which organizes US National Pavilions' participation in exhibitions and conferences in the Middle East and North Africa, to promote the 18th WETEX in the US and boost American companies' participation. DEWA is organizing WETEX under the directives of *Mohammed bin Rashid Al Maktoum*, Vice President and Prime Minister of the UAE and Ruler of Dubai, and under the patronage of *Hamdan bin Rashid Al Maktoum*, Deputy Ruler of Dubai, Minister of Finance, and President of DEWA, from 4 – 6 October 2016 at the Dubai International Convention and Exhibition Centre. The signing ceremony was attended by Dr. *Yousef Al Akraf*, Executive Vice President of Business Support and Human Resources at DEWA, and *Waleed Salman*, Executive Vice President of Strategy & Business Development, and senior officials from DEWA. "We are delighted to enter into a partnership with Kallman Worldwide which is accredited by the **US Department of Commerce**. This agreement is in line with DEWA's keenness to enhance participation of US companies in the next WETEX 2016. WETEX 2016 is held under the umbrella of the 3rd Green Week 2016," said Al Tayer. ■

During the signing ceremony

Reed Manufacturing: 120 Years of Success

Piping Solutions, **Reed Manufacturing Company**'s tool training video series, shows how Reed tools make jobs easier. Known worldwide for professional grade pipe tools for professionals, the company is celebrating 120 years as a family-owned and operated business out of Erie, Pennsylvania, United States of America. Recently updated, the video series features several pipe cutters, PE (polyethylene) Scraper, Bevelers, Saw It® Pneumatic Saws, DM3MECH Hot Tapping Machine, Test Pumps, Threading Machines, Power Drives, Tapping & Drilling Machines, PPR Fitting Reamers, R811 Die changeout and PE Squeeze-Off Tools. In response to requests for video training on how to change Reed cutter wheels on large pipe cutters, short clips of that process are available, too. Additionally, all video segments can also be viewed through Reed's YouTube channel. Reed is committed to providing tool knowledge to worldwide customers. Videos provide a platform to both train and inform the viewer about the company's products. ■

Blue-White Elects New Company President

Blue-White Industries has recently announced that on November 2, 2015, by unanimous vote of the company's Industries Board of Directors, *Rob Gledhill* was elected to the position of Company President. Rob has been with the company for more than 25 years and has had experience in all phases of production and marketing. He is highly respected by employees, management, customers and vendors. Rob was instrumental in the development and launch of Blue-White's Pro-Series® and Proseries-M® lines of metering pumps and flowmeters. The new company president has also helped develop new production methods in the machining and assembly phases of the manufacturing process, and more efficient packaging and shipping processes. Furthermore, the company looks forward to continued growth and success under Rob's leadership. Blue-White Industries is a manufacturer of metering pumps (diaphragm, peristaltic), flowmeters (variable-area, paddlewheel, ultrasonic), and water treatment accessories. It was founded in 1957. ■

Blue-White president, Rob Gledhill

GEA to Become Preferred Supplier for Nereda Installations

International engineering consultancy **Royal HaskoningDHV** will collaborate with one of the largest providers for equipment and process technology **GEA** to have its sludge dewatering decanter centrifuges certified for the Nereda® technology. As part of the agreement, the companies will collaborate in research and development to further improve the applicability of GEA's sludge dewatering equipment to Nereda-specific conditions. An agreement to this effect was signed at the Aquatech Amsterdam between the two companies. GEA shall invest in and further develop its sludge dewatering equipment for specific use in combination with the Nereda technology. Royal HaskoningDHV will actively support such research and development by making available technical know-how, performance data and access to its Nereda research and development facilities. GEA is proud to be the first Nereda preferred supplier. *Joost Vliegen*, Director Environmental Technology: "The Nereda technology is such a success that it finds its way around the world. As partner of Royal HaskoningDHV in the world-wide Nereda Community, GEA created their own Nereda team that is going to play an important role within the worldwide roll-out and development of this revolutionary system. Meanwhile, *René Noppeney*, Global Director Water Technology Products & Innovation bij Royal HaskoningDHV added: "Our Nereda technology has unique selling points in terms of its footprint, its energy efficiency, sustainability and ease of operation. With this agreement, we aim to make a significant step towards optimization of the sludge line as well. I am very pleased that GEA has decided to become a preferred supplier." Their willingness and drive to invest in R&D to optimize their equipment for our Nereda technology will make a difference for many of our clients world-wide." ■

Sewerage Service Contracts on the Rise

Increasing sewerage charges are making it more important than ever for industrial users of wastewater treatment to consider their options, says newly appointed **WPL** Managing Director *Gareth Jones*. In his ten years at WPL, Jones has seen the Hampshire-based company double in size and the demand for service contracts increase. The former finance director and acting managing director has recently been appointed permanently to the post of managing director of the manufacturer of package sewage and wastewater plants. He says: "Industrial companies facing high sewerage charges are also turning to us to help them manage and maintain their systems. Most companies in the UK pay for their industrial effluent to be treated by their local utility using a calculation called the Mogden Formula. "WPL has a lot of experience helping companies manage their wastewater, meet the regulatory requirements and adjust to local variations. Optimizing effluent treatment can deliver significant cost savings." Jones continues, "Utilities too are increasingly conscious of the regulator's requirement for them to consider total capital and operating expenditure – totex – in investment decision-making. This means service and maintenance contracts are becoming increasingly important to WPL's utility customers. At its base in Waterlooville, WPL manufactures package wastewater treatment plants, which work to the highest environmental standards. While ten years ago the company specialized in plants which could serve the needs of 2,000 people, it has now expanded its range to include models which can serve 10,000 people." ■

A WPL package treatment plant is loaded onto a truck

Singer Valve & Channel Co Sign Agreement

Singer Valve, a manufacturer of control valves has joined forces with **Channel Co Ltd.**, a provider of high quality electro-mechanical equipment, instruments and services to the water industry. *Mark Gimson*, Marketing & Business Development Manager for Singer Valve said, "Channel brings a solid reputation of knowledge and good service, so we are very happy that our products will now be available in Jordan with strong local expertise and support." Channel Co. Ltd, which has been in the market since 1992 and supplies major brands to municipal and industrial water and wastewater treatment; gas treatment and odor control; fluid control; chemical, petrochemical, and oil/gas management; personal safety and protection; and general construction.

Representatives of both companies at the IWA trade show in Jordan

Furthermore, managing director of Channel Co., *Mohammad Nassar* said, "Singer Valve products are manufactured utilizing the latest in water conservation technologies and on par with the highest of international standards. We are happy to supply these and other cutting-edge products to local industries and projects, with a portfolio of major clients such as the **Aqaba Water Company**, **Jordan Phosphate Mines Company**, and **Jordan Petroleum Refinery Company**." Channel is currently working with the Water Authority of Jordan on an expansive project performing upgrades and maintenance on all Singer control valves installed at the water pumping stations in Ma'an and Petra. Since 1957, the company has been designing, manufacturing and distributing pilot operated diaphragm control valves. With innovative technologies, it also provides solutions for water loss management, and water conservation. ■

Trelleborg Takes Over Pipe Liner Production Line

Trelleborg's pipe seals operation has recently integrated additional pipe liner production capabilities at its manufacturing facility in Taurage, Lithuania. The new technology was obtained from TWE / Trelit along with its customer base, which has also been taken over by Trelleborg to ensure continued service. The new manufacturing line is expected to commence production in mid-November and will see a new product added to Trelleborg's pipe liner portfolio - the Drainliner PP. *Bill Hagenberg*, Business Unit President for Trelleborg's pipe seals operation, says: "Since implementing our own liner facility in Lithuania in February 2014, our liner production has increased in 2015 by 50 percent. We expect this speed of growth will continue next year, following the installation of this new technology and an extended customer base. The production line will enable us to significantly increase our output to fulfill the increasing demands from our customers." The Drainliner PP will be produced in Lithuania alongside Trelleborg's other pipe seals solutions, the DrainPlusLiner 2.0, DrainFlexLiner, MtH Liner "Basic", DrainLCR Liner and Hatprofiles. The company's pipe rehabilitation solutions use a no-dig cured in place pipe (CIPP) lining method, meaning that disruptive roadworks are not required. This process uses a flexible tube liner of corrosion-proof synthetic and/or glass fibers, which is wetted inside with reaction resins and introduced into the host pipe through a manhole, access pit or access eye with the help of an inversion unit. ■


Trelleborg's new pipe liner production line in Lithuania

IRENA Helps Countries to Implement Quality Control

can increase ten-fold by 2030, providing electricity solutions to remote areas, integrating into mini-grid systems and even distribution grids. At present, small wind turbines only account for 0.7 GW of installed capacity due in part to the fact that products that do not meet minimum quality requirements are blocking the growth of small wind turbine markets. ■

The most up-to-date information on how to develop and implement quality control for renewable energy technologies is now available. A new series of reports released by the **International Renewable Energy Agency (IRENA)** gives detailed information on how to develop quality infrastructure for small wind turbines and solar water heaters and provides guidelines for policy makers. “With renewable energy technologies becoming competitive and globally traded, additional efforts are needed to protect markets from poor-quality products and services, which can seriously delay renewables deployment growth,” said *Dolf Gielen*, Director of IRENA´s Innovation and Technology Centre. “Therefore, it is of paramount importance to implement instruments to control the quality of renewable energy products and services, mitigate technical risk and build up market trust. Operationalizing international technical standards via testing and certification can address risk and at the same time spur technological improvements.” The report series, Quality Infrastructure for Renewable Energy Technologies, finds that implementing a quality infrastructure is dependent on the country context and the status of the market for a specific renewable energy technology. The reports provide detailed guidance for developing the quality infrastructure incrementally, hand-in-hand with local market development. Furthermore, the report on small wind turbines, for example, finds that the share of small wind turbines

Grundfos Introduces New Range of Products

The new BMS is ideal for high flow and very high-pressure applications in industrial and water treatment systems. The product design, which is 75 percent lighter than its predecessor, focuses on simplicity by removing maintenance-heavy components and facilitating easy access to all vital parts. In addition, a permanent magnet motor has improved pump efficiency by up to 5 percent. Lighter weight does not mean less power, however. The permanent magnet motor is capable of speeds between 4,000 and 5,500 rotations per minute. Motor speed is controlled by a variable frequency drive that consistently operates at the optimal duty point, guaranteeing energy-efficient operation at all times. All new **Grundfos** BMS installed and operated units for different applications like: desalination and petroleum water related pressure boosting applications have impressed all the customers with its new design improvements and efficient performance of the system. The new desalination pump systems are the BMSX and BMST. The BMSX is designed for seawater and brackish water desalination. It consists of a BMShs pump (high speed), a BMShp pump (high inlet pressure) and an isobaric pressure exchanger with an efficiency of up to 98 percent. Furthermore, the BMST booster systems consist of a BMS hs(high speed) and a Pelton turbine. This power pack makes it possible to deliver the same performance as with a standard centrifugal pump and thus save up to 35 percent of the pump's total power consumption. ■

BM, BME3

Huge Hydro Opportunity with New Screw

To meet their ever increasing renewable energy targets and utilize a valuable existing source, water companies should embrace the undoubted hydropower potential in sewage outfalls. **Ham Baker** can now offer a new Screw Generator system made with a low-cost reinforced plastic screw for existing outfalls (1m to 4m head) with flow rates of up to 900 liters per second and the potential to generate up to 30 kW. "It is time for the UK water companies to stop thinking of hydropower as some sort of old fashioned exclusive for areas with the right topography and large water capacities," said *Ian Goddard*, Ham Baker's Business Development Director. "Unlike other forms of renewable energy", he added, "there are no drawn out complications with planning or FITs (Feed-in Tariffs). Instead, in most cases, we're offering an almost plug-in-and-play unit with a full control system that can be put into a sewage channel with minimal civils," Goddard added. Furthermore, he claims that with such a huge number of sewage outfalls in the UK, of which around 75 percent would meet the criteria, the low cost of the plastic screw compared to metal (including reduced transport and installation), presents a golden opportunity for UK water companies. Goddard continued: "Reinforced plastic screw generators are game-changers in their own right. So when one brings in the almost unused existing flow resource of sewage outfalls, those water companies currently without a dedicated hydropower person may soon have to start thinking about appointing one". ■

New Ham Baker plastic screw for Hydro 4

Lutz-Jesco Supplies Metering Pumps & Dosing Systems

Semi-automatic ammonia dilution station

High quality drinking water, swimming-pool water and process water, cooling water or environmentally sound waste water from industry require to all components in the water system, in monitoring water quality and treatment high precision and reliability. **Lutz-Jesco** has gained in the past 60 years in the development, in production and installation of such components an excellent reputation in the world. 150 different products in several thousand variants of the divisions of dosing equipment for liquid, solid and gaseous media daily leave the production facility near Hannover into whole word, e.g. metering pumps, peristaltic pumps, chlorinators or dry feeders. There are also modules for measurement and control equipment for liquids or gases, complete systems for disinfection of drinking water, chemically resistant high-performance centrifugal pumps and custom solutions for metering applications. Main products are: metering pumps and many accessories of different design and sizes suitable for various chemicals, chlorinators complete in various sizes, chlorine dioxide plants and chlorine electrolysis plants for salt water in pool area. When planning a pump application mistakes unfortunately often are made. Therefore, before the purchase of pumps and metering equipment all requirements and conditions for the proposed application must be known and communicated so that the optimum product for this application with the necessary accessories, mostly from the standard program, can be offered. Lutz-Jesco has on this area great experience and know how. ■

NIVUS Presents a New Transmitter Generation

The NivuFlow 600 from **NIVUS group** was designed particularly for flow metering in full pipelines. To meet the highest accuracy requirements it is possible to equip the transmitter with up to 28 measurement paths. Pipe sensors as well as contactless clamp-on sensors are available for various measurement jobs. It is however not necessary to interrupt running processes to install both sensor types. The measurement system is particularly suitable to measure the flow rates of various liquid media in a wide range of applications. The considerably smaller enclosure, compared to its predecessor, saves space being installed in control cabinets thanks to easy DIN rail mounting. Moreover, the NivuFlow 600 units are available in a special field enclosure designed for use in rough ambient conditions. The transmitter's large graphic display permits quick and easy commissioning of the flow meter. It provides extended diagnostic options and allows in-depth analyses of running processes directly on site. Furthermore, the transmitter software was reprogrammed from scratch. Thanks to using future-proof protocols and versatile options for communication and integration, operators have considerable scope when it comes to integrate the NivuFlow 600 into higher systems such as SCADA or process conducting systems. The NIVUS group is a developer, manufacturer and supplier of measurement instruments for water industry. For more than 45 years the company has been pointing the way ahead in measurement technology, continuously developing new products and practice-oriented solutions. ■

NivuFlow 600

Small Pumps Make a Big Difference in Little Rock

"When we took the first look at the **Landia Pumps**, our first response was to laugh," said *Joe Freyer*, Maintenance Supervisor at the Fourche Creek Wastewater Treatment Facility (FCTF) in Little Rock, Arkansas. The pumps were small and did not resemble the big cast iron units they were used to. With over 30 year's experience, not much escapes the watchful eye of Joe and his 15 man team. Comprised of Master Electricians, Pump Mechanics, and Generator Technicians, this highly skilled team was concerned the new pumps would not perform well. However, those small pumps would go on to make a big impact and prove a wise investment. The success of FCTF is widely known, although you would not know it by the modest demeanor of Joe and his team. Or perhaps it's because their hectic schedule does not allow for small talk – they average 650 Work Orders per month. It is apparent to visitors of FCTF the staff takes great pride, and with enthusiasm, works hard to maintain its well-being. "We constantly check everything throughout the facility to ensure we are in good shape," added Joe. "It's an aggressive schedule but we thrive on it. We don't wait until something breaks. Our software is designed to notify us and integrate with our Preventative Maintenance program. For example, Oil levels are checked once a month on our Submersible Pumps and we also inspect the Impellers, once every year." ■

Fourche Creek treatment plant

EIB Invests USD126 Million in Jordan

The **European Investment Bank (EIB)** signed two loan agreements worth USD 126 million for financing two projects in the water and energy sectors in Jordan to support sustainable economic and social development in the country. At a ceremony hosted by the **Ministry of Planning and International Cooperation** in Amman, the two agreements were signed by *Imad Najib Fakhoury*, Minister of Planning and International Cooperation, *Hazim Al-Nasser*, Minister of Water and Irrigation, *Tawfig Habashneh*, Chairman of the Board of the **Yarmouk Water Company**, Engineer *Abdel Fattah Daradkeh*, Managing Director of the **National Electric Power Company (NEPCO)**, Mr. *Andrea Fontana*, Head of the EU Delegation to Jordan and Mr. *Dario Scannapieco*, Vice-President of the EIB. The first project, Wadi Al-Arab Water System II, will support a high priority water supply infrastructure investment. The project will improve drinking water availability for the growing population in the Northern Governorates, which has been significantly increased by the large number of Syrian refugees in the area. The project is in line with Jordan's National Water Strategy and the EIB's External Lending Mandate. The project is co-financed by the EIB (lead financial institution), **Agence Française de Développement** and the **EU Neighbourhood Investment Facility (NIF)**. The EIB's loan of USD 54 million for the project will help to treat and convey 30 million m^3/year of fresh water from the King Abdullah Canal (KAC) in the Northern Jordan valley to the Zabda Reservoir. ■

At the signing ceremony

TAQA: India Hydro Project Starts Producing Power

Abu Dhabi National Energy Company PJSC (TAQA) has recently announced the commencement of sale of power from the 100 megawatt (MW) run-of-the-river Sorang hydropower project in the Indian state of Himachal Pradesh. At full capacity, it can supply emissions-free electricity to 500,000 homes. “We are keen to participate in meeting India’s growing energy needs through the completion of this project which provides cost-efficient power and helps develop renewable energy sources,” said His Excellency *Saeed Mubarak Al-Hajeri*, TAQA Chairman. “Sorang is our third major project to be completed this year, with two other projects set for completion by the end of 2015.” The Sorang hydropower project is powered by the Sorang Khad River which originates in the Himalayas. It uses run-of-the-river technology to convert the river’s natural water flow to electricity, eliminating the need for a reservoir. Al-Hajeri added: “I would like to congratulate our team in India for safely completing this very challenging project in difficult terrain. This has been achieved largely thanks to a disciplined approach to project execution as well as the strong partnerships we have built with the local community and government.” The facility started supplying power to northern India on 31 October 2015. TAQA‘s India operations also include a 250 MW lignite power station in the Neyveli region of southern India. Besides, TAQA is an international energy and water company listed in Abu Dhabi operating in 11 countries across four continents. The company is proud to align its strategy to Abu Dhabi’s Economic Vision 2030, a road map for a sustainable economy with a focus on knowledge-based industry. ■

Largest Membrane Bioreactor System Utilizes PURON®

Koch Membrane Systems (KMS), a global specialist in the development and manufacture of innovative filtration membranes and systems for water and wastewater treatment, announced that the largest MBR plant in Europe is now fully operational, treating 100 percent of its incoming capacity with KMS PURON® MBR modules. The wastewater treatment system was upgraded to an MBR system with 10 trains of PURON® membrane modules to process up to 96,700 m3 (25.5 million gallons) of effluent per day. The PURON® MBR technology modernizes the plant so it will meet future effluent quality and legal requirements of the European Community. The MBR System was constructed at the Carré de Reunion wastewater treatment plant adjacent to the Palace of Versailles gardens. The wastewater treated at the facility will discharge into the small “Ru de Gally” stream, a side arm of the river Seine, which has its source in the palace gardens. “We had very limited space and the reduced footprint of the PURON® MBR modules from KMS was the clear choice. They reduced our space requirements by 1/3 when compared to adding standard basins for purification,” said *Jérôme Colin*, Director, Process of the project **Véolia**. “We got reliable products and great service and support from the KMS team.” ■

PURON® MBR

Masdar Institute Inks New Agreement

The **Masdar Institute of Science and Technology**, an independent, research-driven graduate-level university focused on advanced energy and sustainable technologies, and the world's top ranked engineering university, **Tsinghua University**, has recently signed a collaboration agreement to embark on a faculty and student exchange program intended to support transformative sustainability research. The agreement was signed in the presence of the leaders from both countries at the Great Hall of the People in Beijing. Professor Dr. *Chen Xu*, Chairperson of the University Council, signed the agreement on behalf of Tsinghua University, while His Excellency Dr. *Sultan Al Jaber*, Minister of State and Chairman of the Executive Committee of the Masdar Institute Board of Trustees. Dr. Al Jaber said: "The exchange agreement between Masdar Institute and Tsinghua University is sure to help bring dynamic advancements in water, energy, microsystems and advanced materials to the UAE, China, and the world at large. I also believe this partnership reveals the growing maturity and strength of the UAE's innovation ecosystem and am confident it will help the country achieve its National Innovation Strategy goals." Tsinghua University was recently ranked as being the world's top ranking engineering university, and is one of the nine members in the elite C9 League of universities in mainland China. The two universities will embark on a faculty and student exchange program that includes research in the fields of renewable and clean energy. Areas of renewable and clean energy exploration include solar energy, biofuel, carbon utilization and sequestration. Additional areas to be explored are membrane and thermal desalination, water treatment, satellite technology, deep space exploration, smart cities, and much more. ■

Siemens Helps Transform Wastewater Treatment Plant

Siemens will support the city of Vienna in optimizing its main sewage plant in terms of energy. For this purpose, the company is supplying the control, measuring, analytical and power distribution systems, as well as the low-voltage and medium-voltage switchgear. Furthermore, the order includes the installation and commissioning of the individual systems. The order is worth around USD26 million and is part of "E_OS 2020" (Energy Optimization Sludge Treatment), the largest environmental project ever undertaken by the city of Vienna. As from 2020, the main sewage plant will use sewage gas to generate autonomously all the energy required for the wastewater treatment. For the sewage treatment itself, a particularly efficient method is used with reduced water content and double the solid content. This considerably reduces the energy consumed during anaerobic digestion and gas generation. The main sewage plant, which currently is among the largest energy consumers in the community, should generate an output of 78 GWh of electricity and 82 GWh of thermal energy. In total this method should save about 40,000 metric tons of CO_2 per year. *Christian Gantner*, Director General of the ebswien main sewage plant: "Our conversion of the wastewater treatment plant into a green power plant makes a valuable contribution to both a responsible use of natural resources and to sustainable power generation. The efficient technologies of our partner Siemens play a key role in achieving our ambitious environmental and climate targets." ■

Main sewage plant in Vienna

Events

Events Preview

Photo Courtesy of IFAT

All Set for Saudi Water & Electricity Forum

Held under the patronage of *Abdullah A. Al Hussayen*, Minister of Water & Electricity, and Chaired by Dr. *Saleh Al-Alawaji*, Deputy Minister of Electricity & Chairman of the Board, **Saudi Electricity Company**, the Saudi Water & Electricity Forum is the premier strategic meeting of the water and electricity industries of Saudi Arabia. The Forum is also fully supported by all of the key Government entities relating to the water and power sectors in the Kingdom of Saudi Arabia, the Saudi Electricity Company, **National Water Company**, **Saline Water Conversion Corporation** and **Electricity & Cogeneration Regulatory Authority**. The water sector in the Kingdom has been the recipient of increased government investment year on year, something which is showing no signs of halting particularly as Saudi Arabia ranks as the third largest consumer of water and the largest producer of desalinated water in the world. The Kingdom boasts an extensive water transmission system and a streamlined regulatory regime. Coupled with the extremely attractive water market, is the Electricity sector, which has witnessed an 8 percent increase in demand over the last decade, and a continual growth of projects either being developed or needing to be developed. The Saudi Water & Electricity Forum is the only place to ensure one is kept abreast of the opportunities which exist in these two sectors, have direct access to the key resource and stake holders and gain insights from companies already involved in the market. *Abdullah A. Al Hussayen*, Minister of Water & Electricity said, "this forum will be a platform to present and discuss the issues and challenges facing the sectors of water and electricity and to discuss the right solutions. SWEF is also an opportunity to keep abreast of the latest technologies in these areas, and come up with recommendations including innovative solutions that address the water and electricity problems in Saudi Arabia". ■

A stand for Saudi Electricity Company at a previous event

Re-launching Water Demand Side Management Conference

Water Demand Side Management GCC is a specialized conference addressing the implementation of performance enhancing SMART network solutions to optimize water consumption and improve water sustainability. This conference will take place on 7-8 March 2016, in Dubai, UAE. Over the next 15 years, the UAE's demand for water is estimated to double, resulting in the push to ensure that the country's water resources are sustainably managed. Over half of the world population lives in urban areas, and the number of urban dwellers grows each day. Urban areas, although better served than rural areas, are struggling to keep up with population growth (**WHO/UNICEF**, 2010). Furthermore, water availability is expected to decrease in many regions. Yet future global agricultural water consumption alone is estimated to increase by ~19 percent by 2050, and will be even greater in the absence of any technological progress or policy intervention. Water Demand Side Management GCC will provide a platform for municipal bodies, water authorities, dispatch and distribution specialists, consultants and water users to share best practice, learn from case study examples of successfully implemented solutions, define the value proposition for implementing SMART water solutions and to gain insight into how investment in technology innovation will enable better use of water resources to enable a sustainable future for all. ■

IFAT 2016 to Focus on Wastewater as an Energy Source

Wastewater, sewage gas, sewage sludge – just three “waste products” that contain valuable heat energy that can be recovered. The latest waste-to-heat processes and technologies for use in water, wastewater and sludge treatment will be on show at the next IFAT, which takes place from May 30 to June 3, 2016 at the Messe München exhibition center .“Our exhibitors cover the entire technology spectrum from wastewater treatment to heat recovery and energy from wastewater,” explains *Silvia Fritscher*, Exhibition Director of IFAT. “At their booths they also give best practice examples of new concepts for turning sewage plants into power stations.” There is an awful lot of energy in wastewater and its processing. For example, in sewage gas: In 2014, 1,340 gigawatt-hours of electricity was generated from this “by product” of sewage sludge digestion in German sewage plants alone. This amount of energy can cover the electricity needs of a big city like Frankfurt am Main for an entire year. And the potential here is much larger: There are over 10,000 sewage plants in Germany, but last year only 1,252 of them were making use of sewage gas.

Participants at a previous event

In the temperature of wastewater, also, there is a significant amount of energy. Depending on the application and time of measurement, domestic, commercial and industrial wastewater is between 10°C and 60°C. This energy treasure trove can be tapped into by passing this wastewater via special heat exchangers. ■

International Industry Supports Move to Malaysia

TRENCHLESS ASIA 2016 will mark the ninth event in this successful series and is to be held for the first time at the Kuala Lumpur Convention Centre (KLCC) in Malaysia, 9-10 May 2016. The move to Kuala Lumpur has attracted significant industry support from exhibitors wishing to penetrate this important emerging market where trenchless technology is increasingly utilized in many of the country’s engineering projects.

Headlining the sponsorship program as Platinum sponsors, are **JBP Group** and **Ditch Witch**. **Zhejiang Deqian Machinery Co., Ltd**. is also confirmed as Gold Sponsors. Country Pavilions have been confirmed by Germany, Japan, Singapore and China, each of which will feature several companies displaying a range of products and expertise. Individual stands are also already booked by organizations from Malaysia, United Kingdom, United States of America, Australia and India. The two day exhibition will also incorporate a Conference program being compiled in conjunction with the International Society for Trenchless Technology (ISTT) and in consultation with relevant Government departments and industry associations based in Malaysia. “We are delighted to be supported by local industry to ensure that we present a topical conference program relevant to the Malaysia market, as well as the South East Asia region.” comments *Paul Harwood*, Managing Director of organizers **Westrade Group**. “The move to Kuala Lumpur is a significant step for TRENCHLESS ASIA which has previously been held in Hong Kong, Shanghai and for the past two events in Singapore. Market research suggested that the time was right to move into Malaysia and we look forward to establishing another top quality event in order to bring together a one stop shop for this progressive market.” ■

2016

January

United Arab Emirates

EcoWASTE 2016
International Platform for Advancing Sustainable Waste Management & Recycling
18 – 21
Abu Dhabi National Exhibition Centre
Abu Dhabi - United Arab Emirates
Info:
Claude Talj
Reed Exhibitions
Tel: +971 2 409 0409
E-mail: claude.talj@reedexpo.ae
Web: www.reedexpo.com

United Arab Emirates

International Water Summit
Global Platform for Promoting Water Sustainability in Arid Regions
18 – 21
Abu Dhabi National Exhibitions Center
Abu Dhabi – UAE
Info:
Reed Exhibitions Companies
Tel: +44 20 8271 2134
E-mail: www.reedexpo.com
Web: rxinfo@reedexpo.co.uk

February

Saudi Arabia

Saudi Water & Electricity Forum
Strategic Meeting of the Water & Electricity Industries of Saudi Arabia
07 – 09
Al Faisaliah Hotel
Riyadh – Saudi Arabia
Info:
CWC GROUP
Tel: +44 20 7978 0000
E-mail: SWEFeng@thecwcgroup.com
Web: www.thecwcgroup.com

March

United Arab Emirates

Agra ME 2016
Exhibition Dedicated to Agribusiness Equipment & Technology
13 – 15
Dubai International Exhibition Centre
Dubai – United Arab Emirates
Info:
Informa Exhibitions
Tel: +971 4 336 5161
E-mail: info-mea@informa.com
Web: www.informa-mea.com

April

Saudi Arabia

SBIE 2016
Longest Establishing Exhibition Catering to the Building & Construction Sector
11 – 14
Jeddah Centre for Forums & Events
Jeddah – Saudi Arabia
Info:
ACE Exhibitions
Tel: +966 12 654 6384
E-mail: ace@acexpos.com
Web: www.acexpos.com

Turkey

REW Istanbul
12th International Recycling, Environmental Technologies & Waste Management Trade Fair
28 – 30
TÜYAP Beylikdüzü Fair & Congress Center
Istanbul – Turkey
Info:
IFO ISTANBUL FUAR HIZMETLERI A.S.
Tel: +90 (212) 275 75 79
Fax: +90 (212) 288 36 11
E-mail: rew@ifo.com.tr
Web: www.rewistanbul.com

May

Saudi Arabia

SAUDI POWER 2016
19th International Trade Exhibition for Electricity, Alternative Energy, Water Technology, Lighting & HVAC
09 – 11
Riyadh International Exhibition Centre
Riyadh – Saudi Arabia
Info:
Riyadh Exhibitions Co. Ltd
Tel: +966 1 454 1448
E-mail: esales@recexpo.com
Web: www.recexpo.com

Lebanon

Project Lebanon 2016
21st International Trade Exhibition for Construction Material & Equipment
May 31 – June 3
BIEL
Beirut – Lebanon
Info:
IFP Lebanon
Tel: +961 5 959 111
Fax: +961 5 959 888
E-mail: projectlebanon@ifpexpo.com
Web: www.ifplebanon.com

October

United Arab Emirates

WETEX 2016
The 18th Water, Energy, Technology & Environment Exhibition
04 – 06
Dubai International Convention & Exhibition Centre
Dubai – UAE
Info:
Dubai Electricity & Water Authority
Tel: +971 4 3072462
E-mail: contracts@dewa.gov.ae
Web: www.dewa.gov.ae

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subscriptions@cphworldmedia.com

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تمت الطباعة عند شمص للطباعة والنشر

A Holistic Approach Toward Managing Urban Water Supply

نهج شامل من أجل إدارة إمدادات المياه في المناطق الحضرية

The GCC is looking abroad for international best practice that can be adapted to meet the region's growing demand for water. Speaking ahead of his presentation at the upcoming International Water Summit (IWS), which is part of Abu Dhabi Sustainability Week and hosted by **Masdar**, *Rabi Mohtar*, a TEES endowed Professor at **Texas A&M University** and Founding Director of the **Qatar Environment and Energy Research Institute**, highlighted the importance of managing water as part of a system. "The biggest challenge for urban water management is the fact there is competition between sectors for this vital resource," says Mohtar. "Because of continuous urban expansion, there is a growing demand for domestic water supply, which then competes with demand from the agriculture and energy sectors." This, says Mohtar, makes it crucial that water regulators, as well as solutions and service providers, adopt a holistic view that looks at water as part of a nexus with food and energy to optimize its use as a major primary resource.

"Water does not exist in a vacuum – you cannot look at managing water without considering the other sectors that interface with water use, such as food, energy, and utilities," says Mohtar. One example of this tightly interconnected water-energy system is the future ability of wastewater facilities in the US to generate energy, explained Mohtar. Traditionally known for their high energy consumption, these facilities are expected to become energy self-sustainable as a result of innovative technologies that extract bioenergy naturally embedded in the solid waste that is filtered from the water. This energy will then be used to power the wastewater facilities, transforming them into energy recovery units in addition to treating water.

"Of course, there is no blanket solution, and what works in one geographic location may not work for another. However, the overall approach should be one that is at the holistic system level," said Mohtar. "Managing water in isolation is shortsighted and will not produce the desired long-term benefits. By leveraging it as part of the water-food-energy nexus, you are creating a healthy ecosystem in which one resource drives the other instead of competing with it."

Rabi Mohtar
Founding Director
Qatar Environment & Energy Research Institute

تتطلع دول مجلس التعاون الخليجي للبحث عن أفضل الممارسات الدولية المطبقة في دول العالم والتي يمكن تبنيها لتلبية الطلب المتزايد في المنطقة على المياه. وقُبيل محاضرة له في القمة العالمية للمياه بأبوظبي التي تنعقد تحت مظلة أسبوع أبوظبي للاستدامة الذي تستضيفه مصدر، سلّط البروفيسور ربيع مختار، الأستاذ في جامعة (تكساس إيه أند إم)، والمدعوم من محطة الأبحاث الهندسية بتكساس، والمدير المؤسس لمعهد بحوث البيئة والطاقة في قطر، على أهمية إدارة المياه كجزء من هذا النظام. واعتبر مختار أن التحدي الأكبر الذي يواجه إدارة المياه في المناطق الحضرية بالمنطقة يتمثل بالمنافسة بين القطاعات للحصول على هذا المورد الحيوي. وقال: "يبرز الطلب المتزايد على إمدادات المياه المخصصة للأغراض المنزلية جراء التوسع العمراني المستمر، والذي يتنافس بالتالي مع الطلب من قطاعات الزراعة والطاقة، ما من شأنه دفع واضعي التشريعات الخاصة بالمياه ومقدمي الحلول وموفري الخدمات إلى تبني نظرة شمولية تَعتبر المياه جزءاً من منظومة مترابطة تجمع الغذاء والطاقة، لتحسين استخدامها كمورد أساسي وحيوي".

وذكّر مختار بأن المياه "لا تنشأ من فراغ"، معتبراً أنه "لا يمكن النظر إلى إدارة المياه دون أن نأخذ بالاعتبار القطاعات الأخرى التي تشكل المياه مكوناً حيوياً فيها، مثل الغذاء والطاقة والمرافق العامة". وأوضح مختار أن أحد الأمثلة على منظومة المياه والطاقة محكمة الترابط هو قدرة مرافق الصرف الصحي المستقبلية في الولايات المتحدة على توليد الطاقة. فمن المتوقع، كما أشار مختار، أن تصبح هذه المرافق، التي تشتهر بالاستهلاك العالي للطاقة، مكتفية ذاتياً من الطاقة بفضل التقنيات المبتكرة التي تستخرج الطاقة الحيوية الكامنة في النفايات الصلبة التي يتم تصفيتها من المياه في هذه المرافق. ويتم استخدام هذه الطاقة لتشغيل مرافق الصرف الصحي، محولة إياها إلى وحدات لاستعادة الطاقة بالإضافة إلى معالجة المياه.

وأضاف: "ليس ثمّة حل شامل، وما يمكن عمله في موقع جغرافي معين قد لا يصلح لموقع آخر. ومع ذلك، يجب أن يكون النهج الكلي مبنياً على مستوى نظام شمولي. فإدارة المياه بشكل مستقل تعكس قصر نظر للأمور، ولن تتمخض عن المنافع المرجوّة على الأمد البعيد. أما إذا اعتبرناها جزءاً من علاقة قائمة بين المياه والغذاء والطاقة، فإننا بذلك نخلق منظومة صحية يقود فيها مورد واحد الموارد الأخرى بدلاً من التنافس معها".

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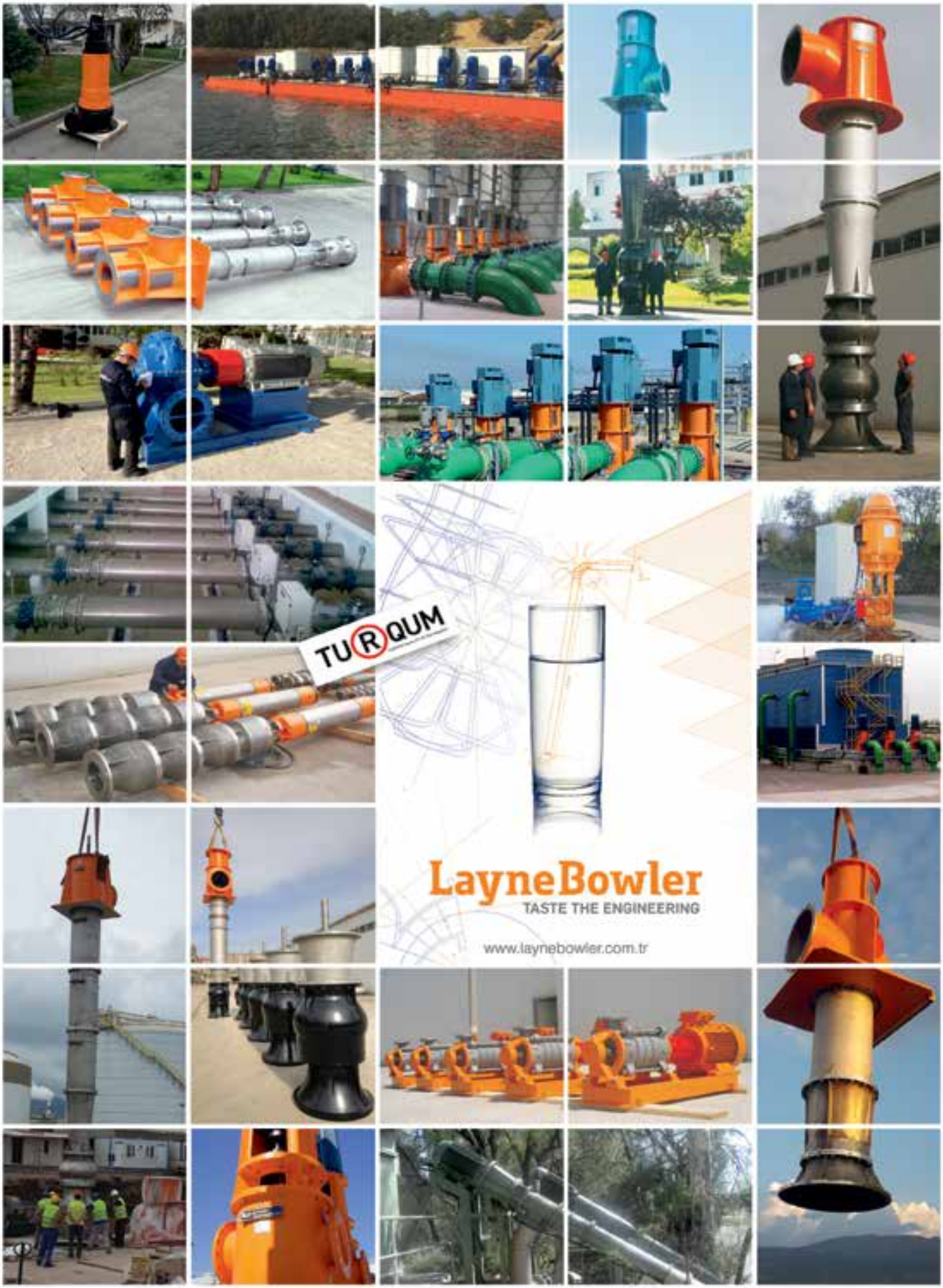
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