TRENCHLESS ARABIA
2ND TRENCHLESS ARABIA CONFERENCE & EXHIBITION

6th ARAB WATER WEEK AND 2nd TRENCHLESS ARABIA CONFERENCE & EXHIBITION

ACWUA
الجمعية العربية لمرافق المياه
Arab Countries Water Utilities Association
GLOBAL CENTER OF EXCELLENCE

06th Arab Water Week | 2023

Ministry of Water and Irrigation

ACWUA
الجمعية العربية لمرافق المياه

6th AWW

أسبوع المياه العربي

Towards Smart & Agile Water Utilities | نحو مرافق مياه ذكية ورشيقة

6TH ARAB WATER WEEK | أسبوع المياه العربي السادس

5TH – 9TH MARCH 2023 | ٥ - ٩ آذار ٢٠٢٣

ST. REGIS HOTEL AMMAN - JORDAN- | عمّان - الأردن - فندق سانت ريجيس

www.arabwaterweek.com

تحت رعاية
صاحب السمو الملكي الأمير الحسن بن طلال المعظم
مؤتمر ومعرض أسبوع المياه العربي السادس
والمؤتمر العربي الثاني لتنفيذ المشاريع بدون حفر
نحو مرافق مياه ذكية ورشيقة
5 - 7 آذار 2023

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هل تعلم أن أعداد المشاركين في أسبوع المياه العربي السادس ٢٠٢٣ هي كالتالي:

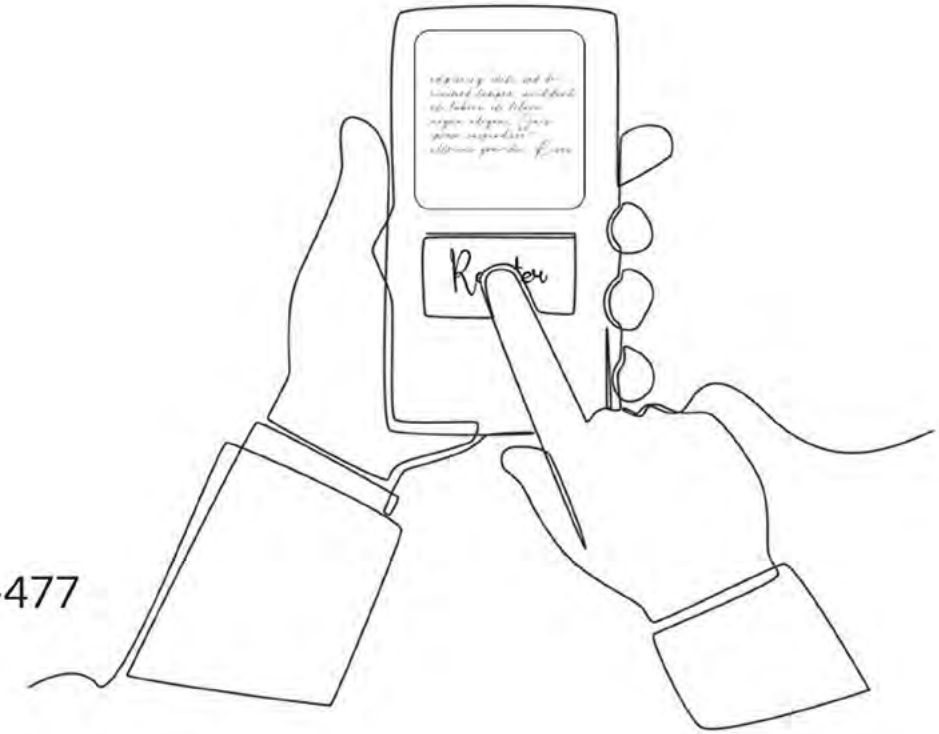
20 شركة عارضة
150 متحدث ومتحدثة
460 خبير وخبيرة مشاركين
30 دولة حول العالم

أهلاً بكم في مؤتمر ومعرض أسبوع المياه العربي السادس، و المؤتمر العربي الثاني لتنفيذ المشاريع بدون حفر.

Did you know that the numbers of the participants in the 6th AWW were as follows:

20 Exhibitors
150 Speakers
460 Participants
30 Countries

Welcome to the 6th Arab Water Week and 2nd Trenchless Arabia Conference and Exhibition.



Reach Us at:

Email: AWW_info@acwua.org

Tel: +962-6-5161-700

Mob: +962-798-519-514 | +962-799-177-477

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TRENCHLESS ARABIA

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AND 2nd TRENCHLESS ARABIA
CONFERENCE & EXHIBITION

ACWUA

AWW2023

SESSIONS

AWW EVENT SCHEDULE
Towards Smart and Agile Water Utilities

أسبوع المياه العربي
Towards Smart & Agile Water Utilities | نحو مرافق مياه ذكية ورشيقة

CONFERENCE OPENING

His Royal Highness Prince El Hassan bin Talal

H.E Ambassador Naif Bin Bandar Al-Sudairi: The Saudi Ambassador to the Hashemite Kingdom of Jordan

H.E. Mohammed Al Najjar: Jordanian Minister of Water and Irrigation

H.E. Sherry F. Carlin: USAID Mission Director in Jordan

H.E. Shahira Wahbi: Director of the Department of Housing, Water Resources & Disaster Risk Reduction at the League of Arab States (LAS)

H.E. Mosbah Helali: President & CEO of SONEDE, ACWUA Chairman of BoDs

H.E. Khaldon Khashman: Secretary General of Arab Countries Water Utilities Association (ACWUA)

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AND 2nd TRENCHLESS ARABIA
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Ministry of Water
and Irrigation

AWW EVENT SCHEDULE
Towards Smart and Agile Water Utilities

أسبوع المياه العربي
Towards Smart & Agile Water Utilities | نحو مرافق مياه ذكية ورشيقة

WATER SCARCITY AND SUSTAINABLE DEVELOPMENT
HIGH LEVEL PANEL

H.E Alexandra Rydmark
Sweden's Ambassador | Jordan

H.E Khaldon Khashman
Secretary General of Arab Countries Water Utilities Association (ACWUA)

H.E Shadad Alatili
Secretary General of the International Water Bank and Board member of Directors

Dr. Youssef Brouziyne
Regional Representative & CGIAR Water System Lead in MENA (IWMI)

CHAIRMAN:

H.E. Dr. Hazim Elnaser
Former Minister of Water and Irrigation Jordan | **Chairman of the Middle East Water Forum**

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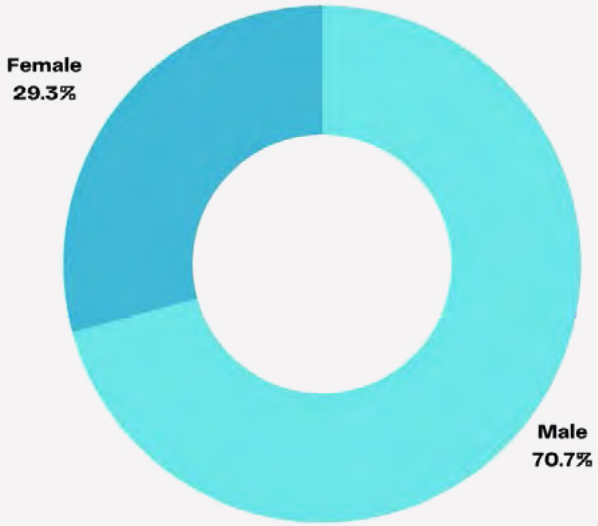
تحت رعاية
صاحب السمو الملكي الأمير الحسن بن طلال المعظم
مؤتمر ومعرض أسبوع المياه العربي السادس جنباً لجنب مع المؤتمر العربي الثاني لتنفيذ المشاريع بدون حفر
نحو مرافق مياه ذكية ورشيقة
٥ - ٧ آذار ٢٠٢٣
Co.
Organizer:



GWOPA
Global Water Operators' Partnerships Alliance
UN-HABITAT
FOR A BETTER URBAN FUTURE

SESSION (1)

MENA Region WOP Platform

Organized by: UN-Habitat - Global Water Operators' Partnership Alliance

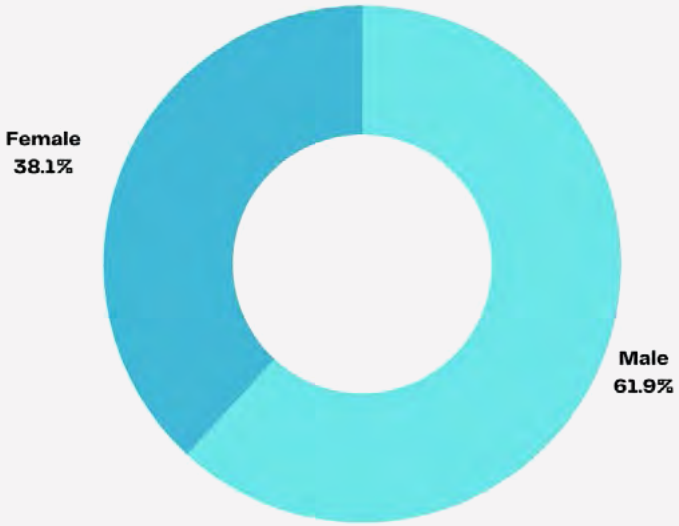
Ahmad Abu Saoud
System and Information Technology Development Manager
Aqaba Water Company

Khaldon Khashman
Secretary General
ACWUA

Mohammad Al Hmaidi
Chief Executive Officer
Water Sector Regulatory Council

MODERATED BY:

Emrah Engindeniz
Programme Management Officer| **GWOPA**



USAID
FROM THE AMERICAN PEOPLE

SESSION (2)

The National NRW Strategy and its implementation

Organized by: USAID-WGA Project

Aseel Hijazeen
Head of planning Department
Miyahuna Zarqa

Fadi Al Twal
Utility Operations Specialist
USAID - WGA

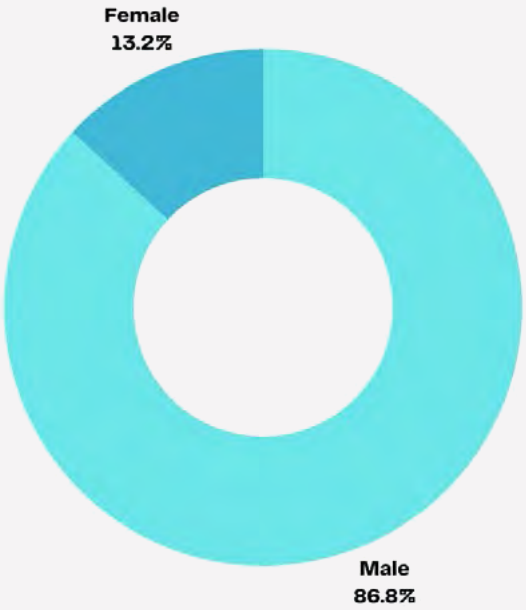
Laith alnsour
Head of Control Department
Jordan Vally Authority

Tamer Al-Assa'd
Deputy Cheif of Party
WGA

Kholoud Albashtawi
Manager of Strategic Planning Directorate
Jordan Valley Authority

Yazeed Athamneh
Financial analyst and planning person
WGA Project

Abdelaziz Telfah
Energy Unit Head/SCADA Engineer
Yarmouk Water Company



SESSION (3)

Digitization at Water and Wastewater Utilities

Eyad Sahawneh
NRW Manager
Individual Consultant and Researcher

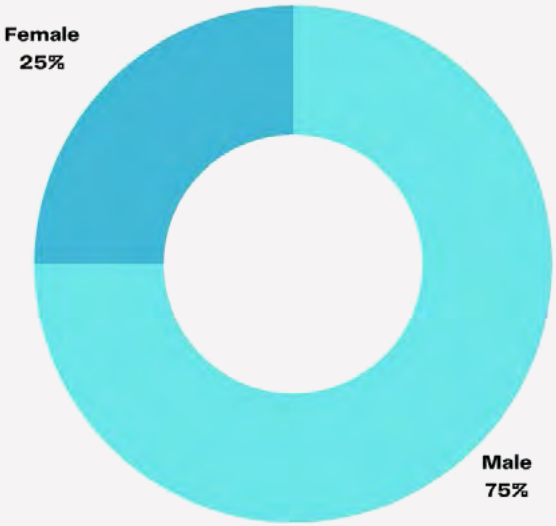
Mustafa Khan
Regional Sales Director
VIVAVIS

Nabil El Kadsi
Area Manager Africa & LATAM
NIVUS GmbH

Rifat Kurban
Assistant Professor, PhD
Kayseri University

MODERATED BY:

Kamal Zoubi
Water Engineer and Utility Manager | **Consultant**



SESSION (4)

Trenchless Arabia

Lutz Kaiser
Head of IBG's IBB16 pressure Pipe Division.
IBG HydroTech GmbH

Werner Reinhold Reiner
Director Overseas
RELINE EUROPE GmbH

Roger Wahl
Managing Director
Tracto Techhnik UK LTD

MODERATED BY:

Yasin Torun
Chairman, TSITT | **TORENCON Engineering and Consulting Ltd**

USAID
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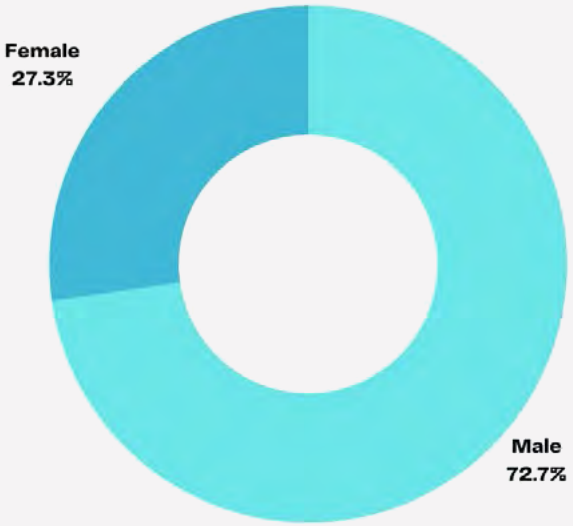
SESSION (5)

Improving and Expanding Water Networks and Wastewater Treatment Plants

Organized by: USAID Water Engineering Services (WES)

Mohammad Sutari
Team Lead **| USAID WES Project**



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SESSION (6)

USAID-NRW Project - Lessons Learned and Future Perspective's (Miyahuna Case Study)

Organized by: USAID - MESC II Project

Essa Halaby
Chief Information Officer (CIO)
WAJ

Nahel Maayta
Monitoring, Evaluation, and Learning Specialist
USAID MESC II Project

Malak Al-Ma'aita
Manager of Performance monitoring unit
Jordan water company

Dina Abida
Institutional Development Specialist
USAID MESC II Project

Motasem Haddadin
Team Leader - NRW Specialist
USAID MESC II Project

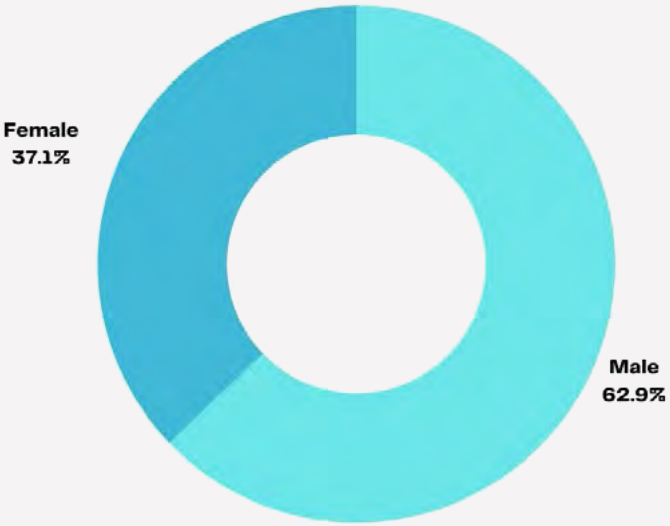
Abdullah Al-Jarrah
Director of NRW
Miyahuna Company

Mohammed kharabsheh
CEO Assistant for Amman
Miyahuna Company

MODERATED BY:

Raid Zraikat
Chief of Party
USAID MESC II Project

Naem Saleh
Deputy Chief of Party
USAID MESC II Project



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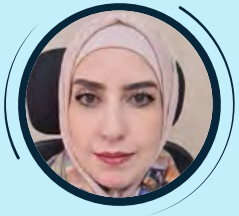
SESSION (7)

Regulation Monitoring of Water & Sanitation Utilities in the Region

Organized by: GIZ - Jordan



Abeer Ahmad Theeb Khair Eddin
Internal Audit and Internal Control Director
Miyahuna

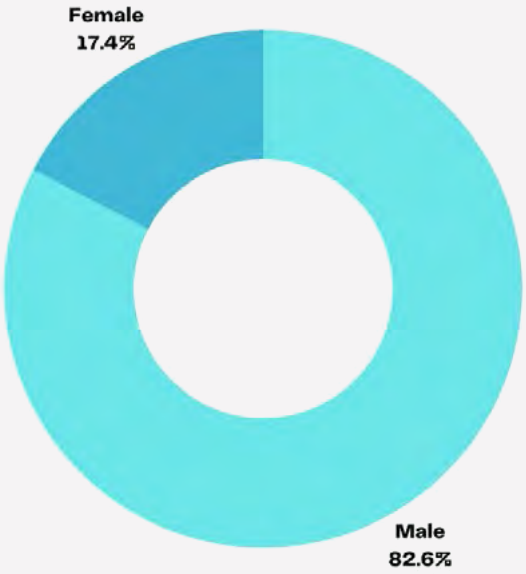
Ahmad Abdellatif AlAzzam
Utilities Performance Monitoring Unit (UPMU) Director
Ministry of Water and Irrigation

Khair alhadidi
Lecturer at Department of Water Resources and Environmental Management
Al Balaqa Applied University

Saja Khashman
Senior Specialist Excellence and Institutional Development
Ministry of Education-UAE

MODERATED BY:

Mohammad Said Al hamidi
Chief Executive Officer | **Water Sector Regulatory Council**



SESSION (8)

Governance, policies and tools in water Management

Fadia Tashtush
Environmental Specialist
Arabian Gulf University

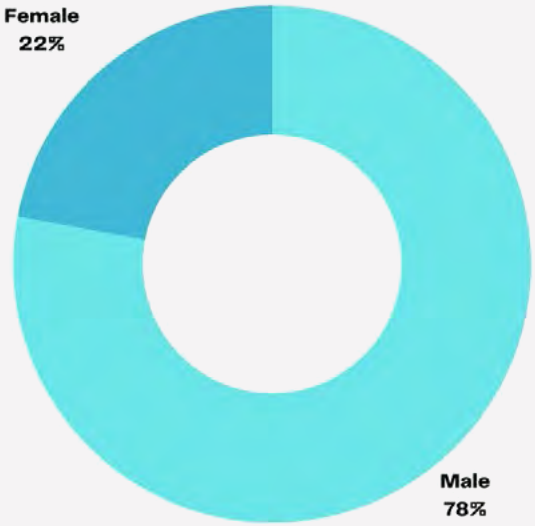
Refaat Bani-Khalaf
Director of Water Safety and Protection Directorate
Water Authority of Jordan

Rihab Al Tarawneh
Director of Policies and Strategic Planning Directorate
MWI/ JORDAN

Kholoud Albashtawi
Manager of Strategic Planning Directorate
Jordan Valley Authority

MODERATED BY:

Waleed Abdelrahman
Member of ACWUA Board of Directors | Vice President, Arab Water Council



WATER AND CLIMATE CHANGE FINANCING CHALLENGES AND POTENTIAL OPPORTUNITIES -WATER SECTOR IN YEMEN

HIGH LEVEL PANEL

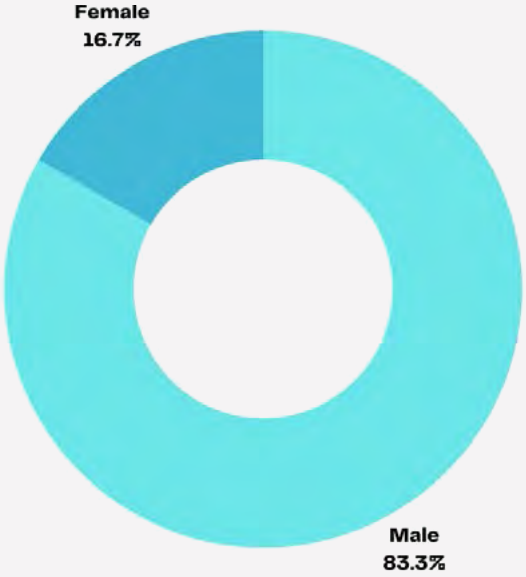
معالي المهندس واعد باذيب
وزير التخطيط والتعاون الدولي - الجمهورية اليمنية

معالي المهندس توفيق الشرجبي
وزير المياه والبيئة - الجمهورية اليمنية

معالي السيد احمد لملس
وزير الدولة، محافظ العاصمة المؤقتة عدن

MODERATOR & KEY SPEAKER

عطوفة المهندس خلدون حسين الخشمان
أمين عام الجمعية العربية لمرافق المياه - اكوا



SESSION (10)

Trenchless Arabia

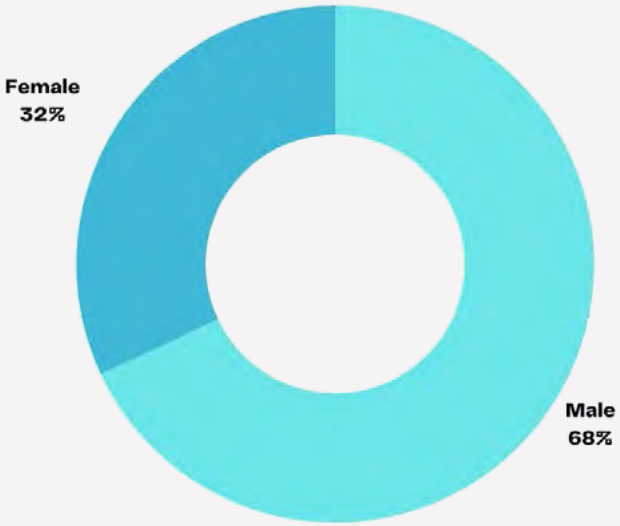
Adulkadir Aydin
Control Chief
Istanbul water and sewerage administration

Mohamed Shehata
Business Development Manager
Herrenkencht AG

Otto Ballintijn
CEO
REDUCT NV

MODERATED BY:

Yasin Torun
Chairman, TSITT | **TORENCON Engineering and Consulting Ltd**



SESSION (11)

Governance, policies and tools in water Management

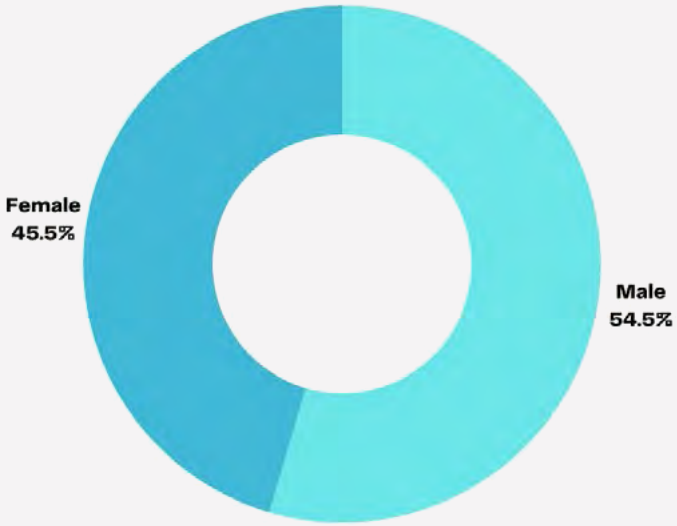
Hadeel Smadi
Head of water Information System and Water Budget Department
Ministry of water and Irrigation

Hisham Almaharmeh
Head of Technical Support Department
Ministry of water and Irrigation

Safa Al-Shraideh
Head of water re-allocation division at strategic planning
Ministry of water and Irrigation

CHAIRMAN & KEY SPEAKER:

Waleed Al-Zubari
Professor of Water Resources Management | **Arabian Gulf University**



SESSION (12)

Water System-NRW

Radwan Al-Weshah
Professor and Former Dean
The University of Jordan, Amman

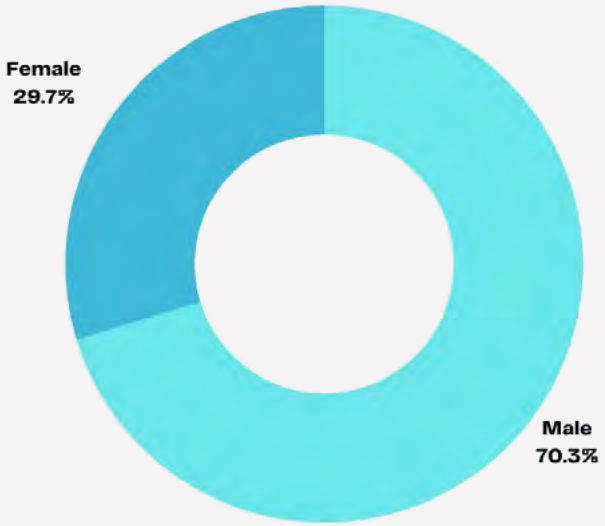
Samet KIRAN
Manager of Asian Water Losses and Pressure Management
Istanbul Water and Sewerage Administration-İSKİ

Tariq Al-Zu'bi
Water Managment Specialist
Consultant

Jomana Aldweiri
Jordan Valley Authority

MODERATED BY:

Munjed M. AL-Sharif
Associate Professor in Natural Resources Engineering and Management | **German Jordanian University**



WATER AND CLIMATE CHANGE FINANCING CHALLENGES AND POTENTIAL OPPORTUNITIES -WATER SECTOR IN IRAQ

HIGH LEVEL PANEL

Ali Almohamadawy
Director General of Dams Administration
Media Spokesman
Ministry of Water Resources - IRAQ

Faisal Aledhari
General Manager
APSU

Lara Atallah
Cashcom General Manager

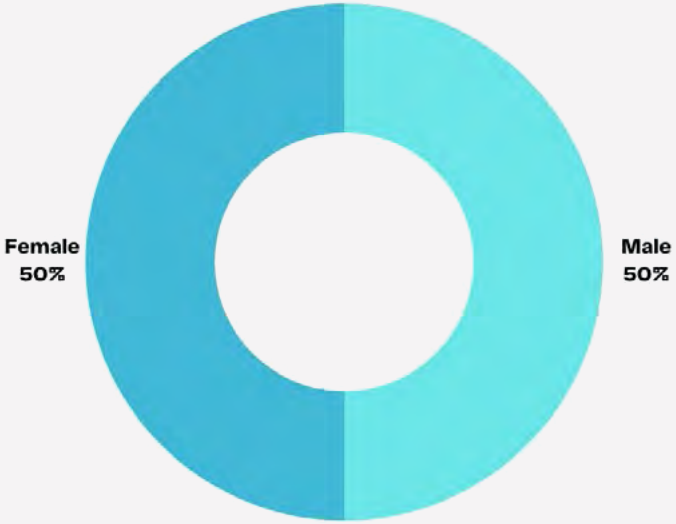
Khaldon Khashman
Secretary General
ACWUA

Mufleh Al Alaween
Water Advisor
The Swiss Agency for Development and Cooperation (SDC)

Ahmed Gharbawee
WASH Specialist
UNICEF IRAQ- central area

Manal Sami Alshraideh
Leading Expert in Water Governance | **SIWI**

MODERATOR:



SESSION (14)

Addressing Water Scarcity Challenges from Multiple Perspectives in the Arab Region

Organized by: FAO

Magnus André
Regional Programme Manager
SIDA - MENA

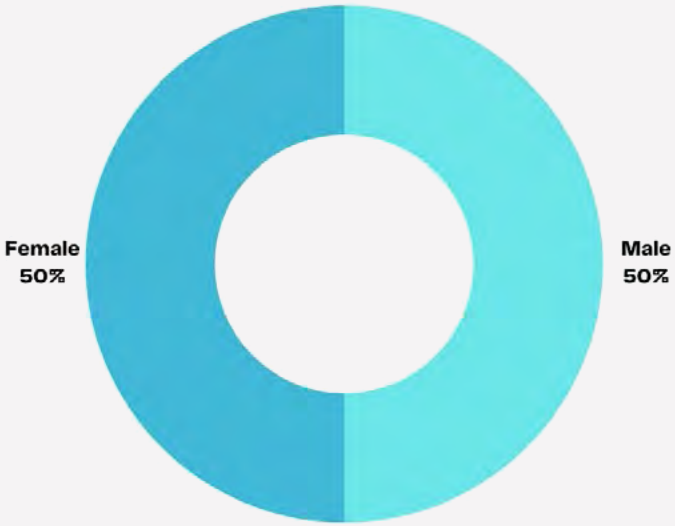
Kitka Goyol
Chief of Water, Sanitation and Hygiene
UNICEF Jordan

Emad Karableh
ESCWA Consultant
The University of Jordan

Dhahbi Ghanmi
Director of Irrigation and Agricultural Water Use
Ministry of Agriculture, Water Resources, and Fisheries, Tunisia

MODERATED BY:

Mohamed Al-Hamdi
Senior Land and Water Officer & Delevery Manager



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SESSION (15)

Regional Dialogue on the sustainable Reuse of Treated Sewage Sludge

Organized by: GIZ - Jordan

Nora Ziani
General Director of national SanitationUtility

Salam Al Momany
Team Leader GIZ - Sustainable Sludge Management Project (SSM) and Environmental Consultant

Miriam Velasco
Team Leader GIZ Enhancing Water Resource Management Project (WAMA)

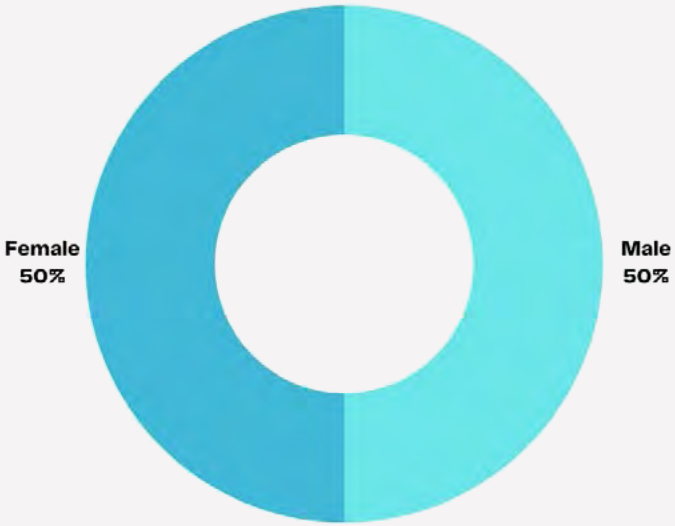
Nadine Ghantous
Technical Advisor GIZ - Sustainable Sludge Management Project (SSM)

Mirvat Kreidiyeh
Ministry of Energy and Water-Lebanon

Wa'el Al-Dweiri
Assistant Secretary General for Wastewater Technical Affairs
WAJ

MODERATED BY:

Esmaeil Ibrahim
Senior Wash (Water, Sanitation , Hygiene) and Climate Specialist



SESSION (16)

Digitization at Water and Wastewater Utilities

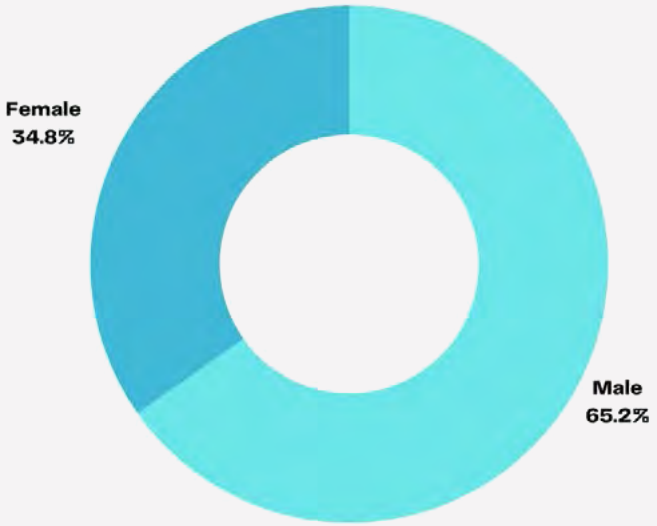
Malak Al-Ma'aita
Manager of Performance Monitoring Unit
Jordan water company

Osama Gazal
Director
MWI

Mohammad Alatrash
Expert

MODERATED BY:

Mohammad Mahameed
Southern Govern Orates Director | **Aqaba Water Company**



SIWI

SESSION (17)

Water Governance for a Water Secure Region

Organized by: SIWI

H.E Alexandra Rydmark
Sweden's Ambassador | Jordan

Karin Gardes
Chief Operating Officer | **SIWI**

Philip Beetlestone
Director | **SIWI**

Khaldon Khashman
Secretary General | **ACWUA**

Manal Sami Alshraideh
Leading Expert in Water Governance | **SIWI**

Majed Abu-Zreig
Professor of Water Resources and Environmental Engineering
JUST University

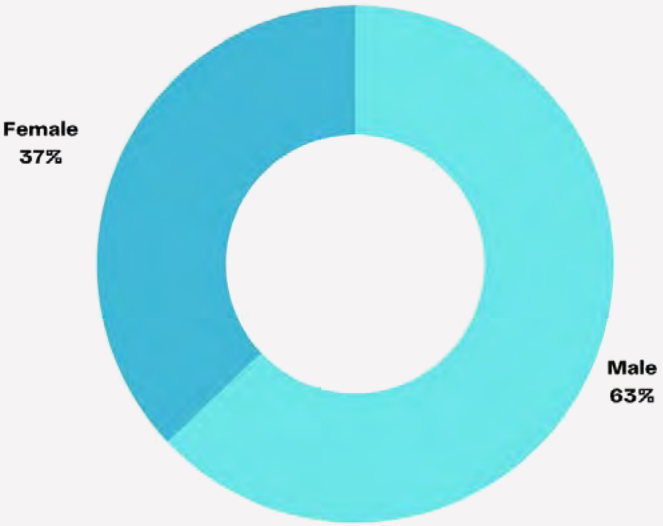
Mufleh Al Alaween
Water Advisor
The Swiss Agency for Development and Cooperation (SDC

Tarik Hassan
Climate Change Specialist
UNICEF MENA

Amal Aldababseh
Regional Hub for Arab States | **UNDP**

Esmaeil Ibrahim
Senior Wash and Climate Specialist

MODERATOR



SESSION (18)

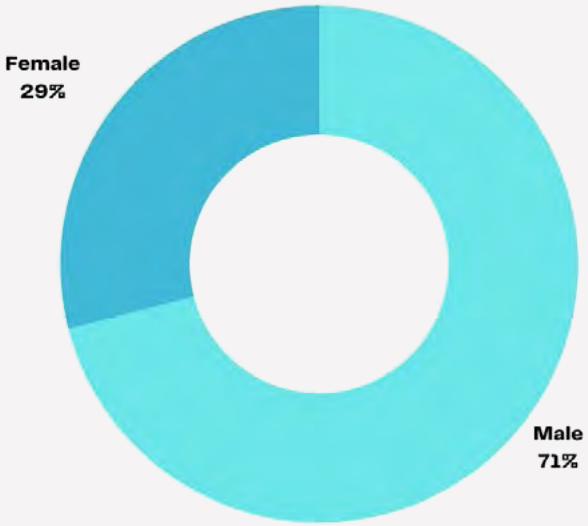
Digitization at Water and Wastewater Utilities

Raid Khawaldeh
Chairman & CEO
Shepherd

Nidal Hachicho
Head of Customer Relations Department
South Lebanon Water Establishment

KEY SPEAKER & MODERATOR:

Ahmad Abu Saod
System and Information Technology Development Manager | **Aqaba Water Company**



SESSION (19)

Water System-NRW

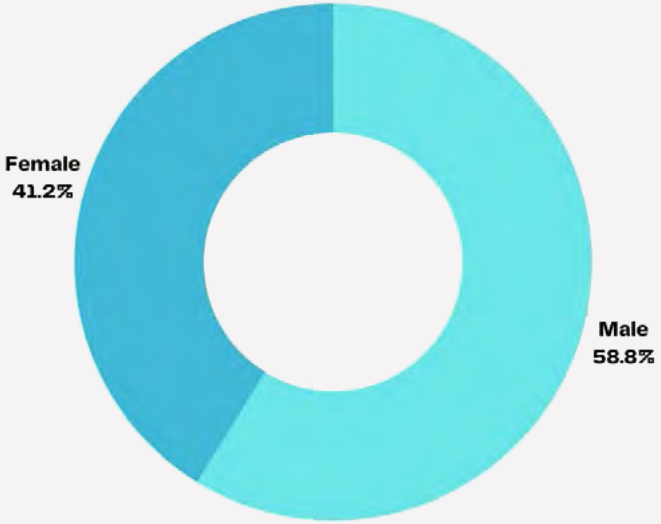
Eyad Sahawneh
NRW Manager
Individual Consultant and Researcher

Jan Janssens
Team Leader
GOPA Infrastructure

Tamer Al-Assa'd
Deputy Cheif of Party
WGA

MODERATED BY:

Radwan Wshah
Professor and Former Dean | **The University of Jordan**



SESSION (20)

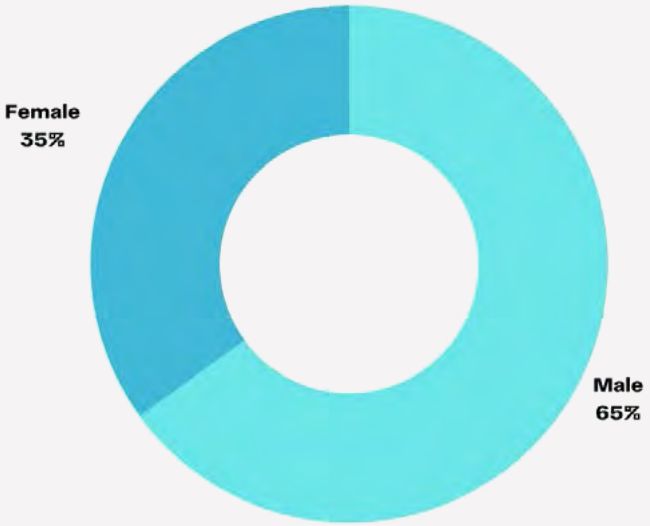
Governance for Groundwater Management

Adel Alobeiaat
Assistant Secretary General for Technical Affairs
Ministry of Water and Irrigation

Hassan Khrisat
Senior Research of Water and Soil Administratio
National Agricultural Research Center

KEY SPEAKER & MODERATOR:

Rakaad Taani
Water Resources Expert | **Consultant Specialist**



IWMI
International Water Management Institute

SESSION (21)

Nexus Perspective in Water Reuse Projects Regional Scientific Evidence for Policy Advice

Organized by: IWMI

Ahmad Nasrallah
Country Director | Egypt
WorldFish

Jacob Waslander
The Dutch envoy to the Middle East and North Africa for Water, Energy and Food

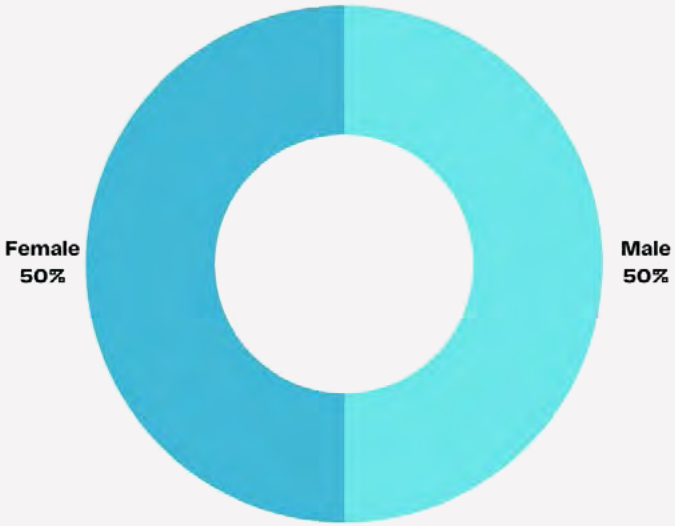
Ziad Khayat
Economic Affairs Officer
United Nations Economic and Social Commission for Western Asia (ESCWA)

Maroun Moussallem
Senior Consultant at Economic and Social Fund for Development
Lebanon

Youssef Brouziyne
Regional Representative & CGIAR Water System Lead in MENA (IWMI)

Khaldon Khashman
Secretary General
ACWUA

Maha Alzoubi
F2R-CWANA initiative Co-Lead
IWMI



SESSION (22)

Water Systems-Water Quality and Laboratory Management

Amal Alsayahien
Director of Water Resources Monitoring and Studies
Ministry of Water and Irrigation

Anham Salyani
Programme Management Specialist
World Water Quality Alliance WWQA

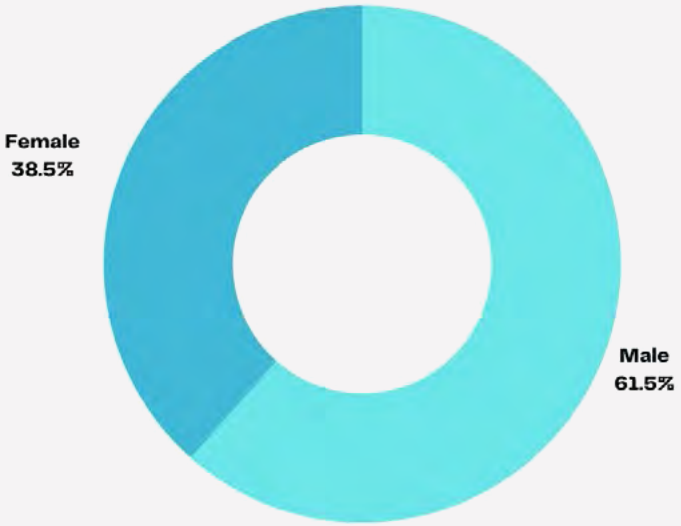
Nazik Abdallat
Head of Water Safety Plan Section
Jordan Water Company - Miyahuna

Munther S. Al-Qudah
Water Quality Manager
Jordan Water Company-Miyahuna

Tharwh Qutaish
Manager of Environmental Monitoring & Research Central Unit
Royal Scientific Society

MODERATED BY:

Susan Kilani
Senior Specialist and Trainer in Water Quality



SESSION (23)

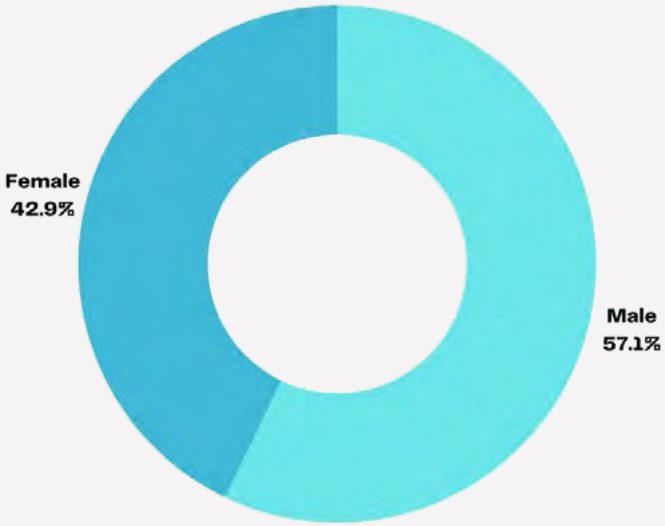
Knowledge Transfer for Utilities

Fadwa Abdulqader
Gender Equality, Social Inclusion and Youth Manager
USAID Water Governance Activity

Mohammad Khair Irshaid
Consultant of the RPL and Skills Development
E-TVET Sector

MODERATED BY:

Ahmad Abdellatif AlAzzam
Director of Utilities Performance Monitoring Unit (UPMU) | **UPMU**



SESSION (24)

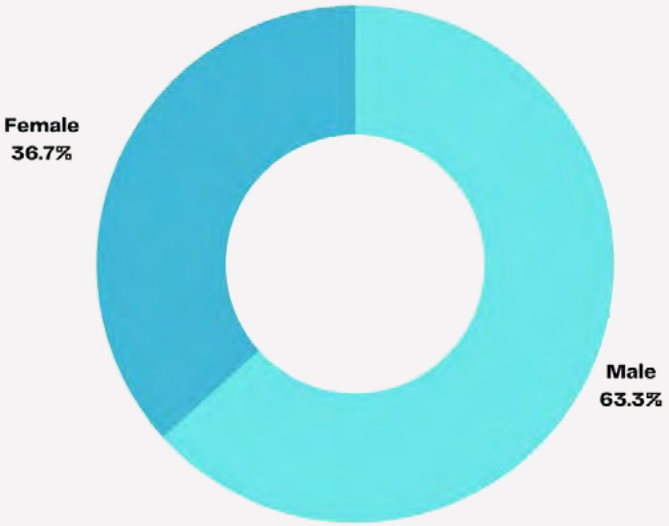
Managing Water Utilities Through Crisis

Mai Wardeh
Civil Engineering Research and Innovation for Sustainability (CERIS)
Instituto Superior Técnico (IST) University of Lisbon

Yousef Alaitan
Advisor
Expert

KEY SPEAKER & MODERATOR:

Esmaeil Ibrahim
Senior Wash (Water, Sanitation , Hygiene) and Climate Specialist



POLICIES, LEGISLATIONS AND REFORM

HIGH LEVEL PANEL

H.E. Munther Hadadden
Former Minister of Water and Irrigation - Jordan

H.E. Jihad Mahameed
Secretary General - Jordan MWI

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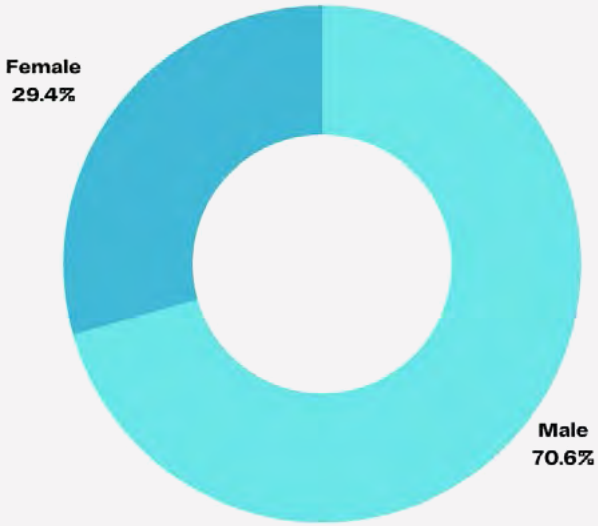
Karin Gardes
Chief Operating Officer | **SIWI**

CHAIRMAN:

Raed Al-Daoud
CEO | **ECO Consult**



world waternet

SESSION (26)

Utilities Cooperation through Sanitation and Water Operators` Partnerships (SWOPs)

Organized by: World Waternet

Duaa Matar
Project Coordinator
World Waternet/Palestinian Water Authority

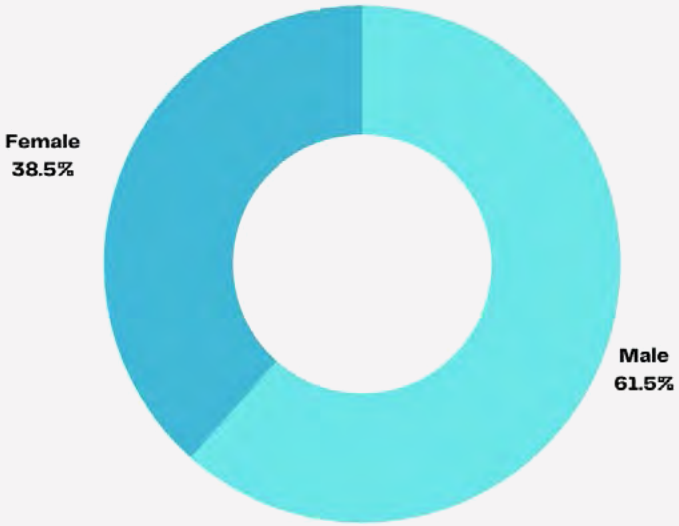
Njord Oskam
Responsible for P&L
World Waternet

Idris Alhababseh
Head of Sewage Department
Miyahuna

Hamza Al Hayek
Sewer pipes trouble solving and cleaning
Yarmouk Water Company

MODERATED BY:

VAN DER LUGT, Kees
Regional director | **World Waternet**



SESSION (27)

Digitization at Water and Wastewater Utilities

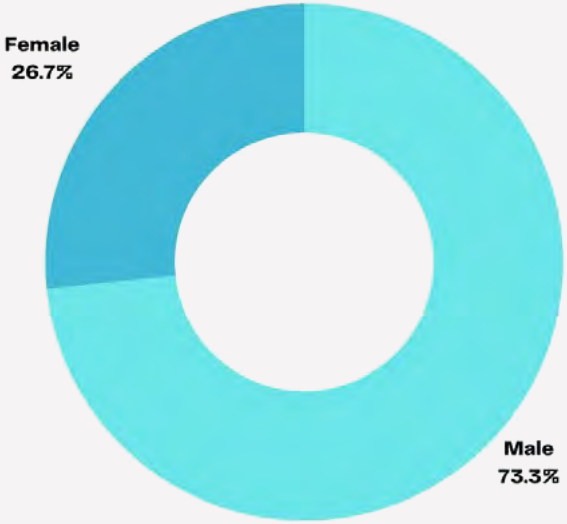
Montaser Abdallah
Human Resources and Training Department Acting Manager
Aqaba Water Company

Laith alnsour
Head of Control Department
Jordan Vally Authority

Mostafa Aldardsawi
NRW & EE Manager
Aqaba Water Company

MODERATED BY:

Ahmad Abu Saoud
System and Information Technology Development Manager | **Aqaba Water Company**



SESSION (28)

Staregic Planning and Financaial Modalities in Water Utilities

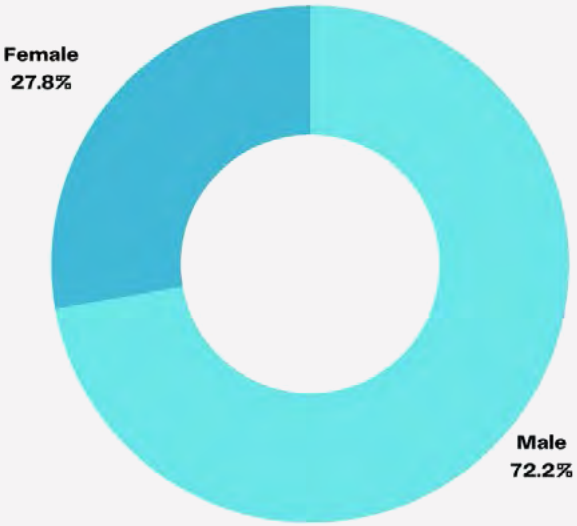
Ahmad Al-Azzam
Managing Director
Allied Business Advisors

Tamer Al-Assa'd
Deputy Cheif of Party
WGA

Yazeed Athamneh
Financial Analyst
WGA

KEY SPEAKER & MODERATOR:

Mohammad Said Al hamidi
Chief Executive Officer | **Water Sector Regulatory Council**



UN-HABITAT

SESSION (29)

Utilities Towards SDG 6

Organized by: UN-Habitat

Faisal Aledhari
General Manager
APSU

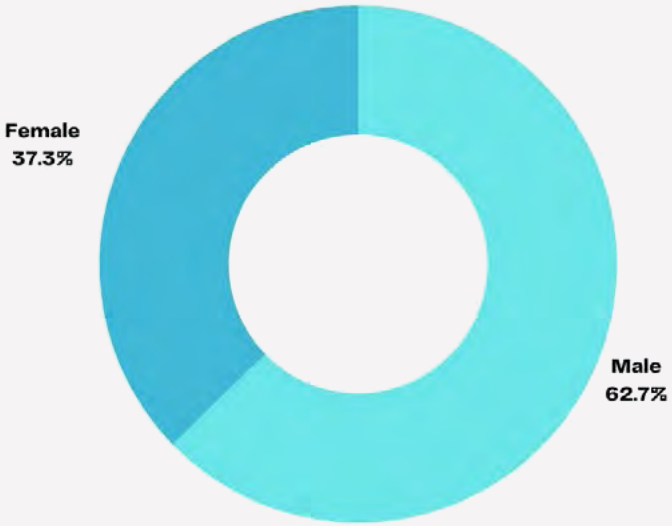
Basim Hasan
Head of SDG Division
MWI Jordan

Khaldon Khashman
Secretary General
ACWUA

Mohammad Al Hmaidi
Chief Executive Officer
Waster Sector Regulatory Council

CHAIRMAN & KEY SPEAKER:

Waleed Al-Zubari
Professor of Water Resources Management | **Arabian Gulf University**



HAMBURG WASSER

SESSION (30)

Utilities Cooperation through Water Operators` Partnerships (WOPs)

Organized by: HAMBURG WASSER

Toqa Qadi
Project Coordinator
World Waternet/Palestinian Water Authority

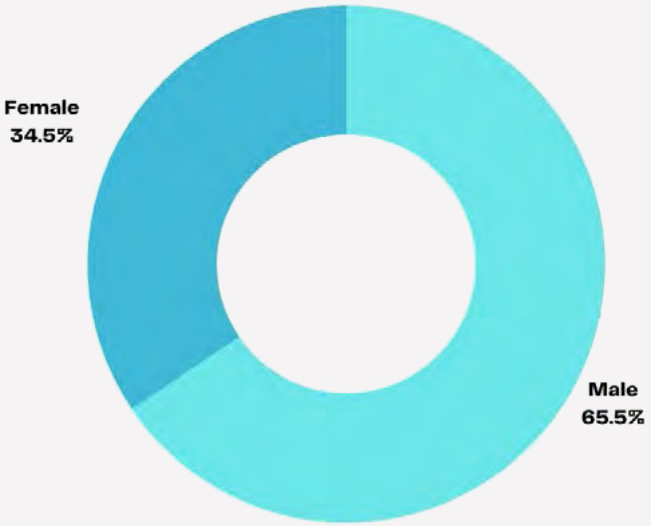
Christoph Czekalla
Senior Stratigic Advisor
HAMBURG WASSER

Haitham Alkailani
Production Director
Miyahuna

Malak Al-Ma'aita
Manager of Performance monitoring unit
Jordan water company

MODERATED BY:

Claudia Wendland
Head of International Cooperation | **HAMBURG WASSER**



SESSION (31)

Water, Energy, Environment and Food (WEEF) Nexus

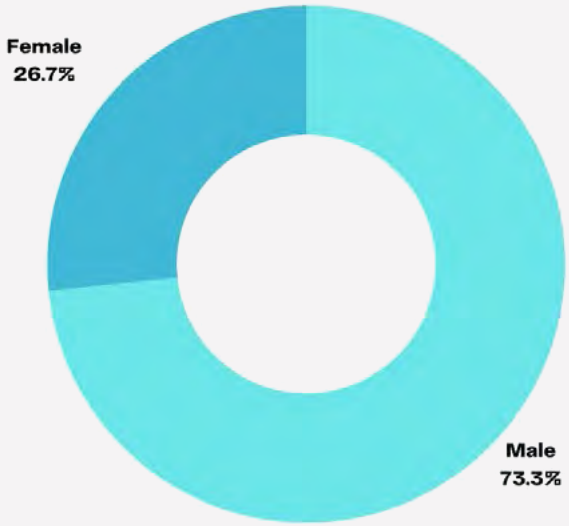
Sebastian Andreassen
Co-founder, CCO & Director
Cembrane

Maha Halalsheh
Associate researcher
Water, Energy and Environment Center/ JU

Waled Elkhoby
Professor, Agronomy Department, Rice Research & Training Centre
Agricultural Research Centre, Egypt

MODERATED BY:

Youssef Brouziyne
Regional Representative | **IWMI**



SESSION (32)

Energy Efficiency

Samuele Torelli
Area Manager
SAER

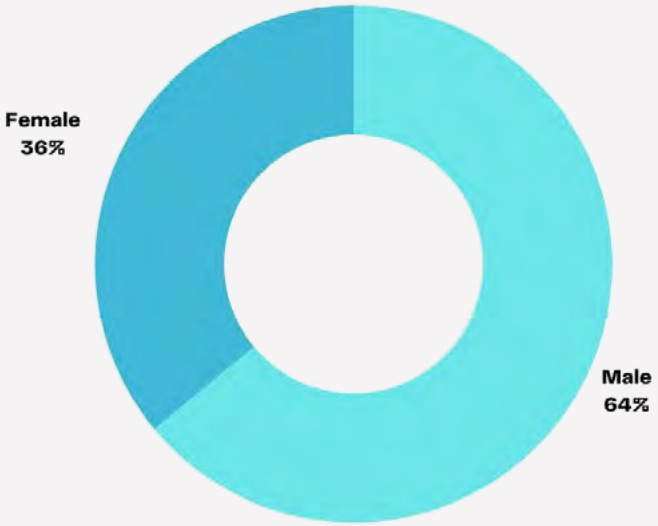
Mohammad Abushanab
Country Manager
Wilo

Hammam Soliman
Senior Sales and R&D Manager
Aalborg CSP

Iyad Al-Zreiqat
Research Assistant
Technische Universität Berlin

MODERATED BY:

Amer Mokbel
ADVISOR | **SAER ELETTROPOMPE**

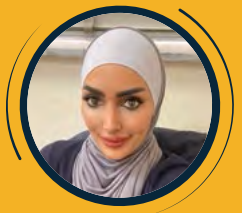


SESSION (33)

Climate Change

Hana'a Muheisen
Head of Studies and Development
Water Authority of Jordan

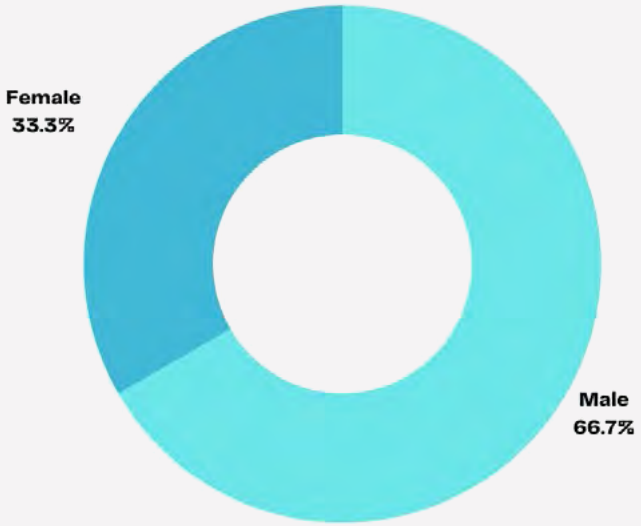
Muttasim Hayari
NAJMAH coordinator
National Alliance Against Hunger and Malnutrition



Rana Ardah
Manager of Water Studies at the Water, Environment and Climate Change Centre
Royal Scientific Society

CHAIRMAN & KEY SPEAKER:

Waleed Abdelrahman
Member of ACWUA Board of Directors | Vice President, Arab Water Council



SESSION (34)

Governance, policies and tools in water Management

Kamal Zoubi
Water Engineer and Utility Manager
Consultant

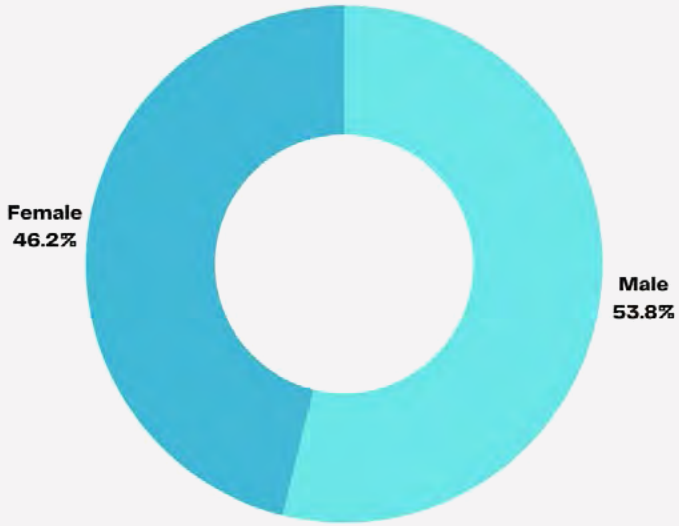
Hela Nacef
Head of Department of Quality Management
SONEDE

Tamer Al-Assa'd
Deputy Cheif of Party
WGA

Anwar Aladwan
Manager of Directorate of Water Users Association
Jordan Valley Authority

MODERATED BY:

Muna Abu-Dalo
Professor in Environmental Science and Engineering | **JUST**



SESSION (35)

Sanitation Systems

Abeer Bawab
Professor in the field of Applied Physical Chemistry
University of Jordan

Farah Kamaleddine
Masters student
American University of Beirut

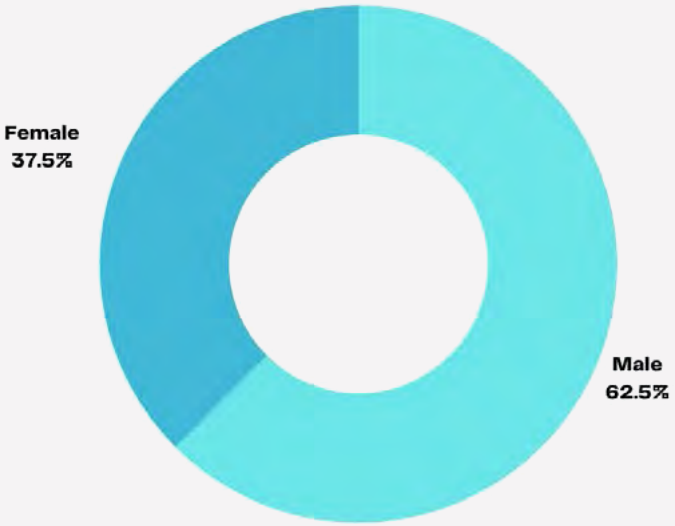
Othman Almashaqbeh
Assistant Researcher / Head of Emerging Pollutants Research Group
Royal Scientific Society

Paulo Rodrigues
Ph.D. Student
IST - Instituto Superior Técnico of University of Lisbon

Mohammed Matouq
Editor in chief
Al-Balqa Applied university

MODERATED BY:

Maha Halalsheh
Associate Researcher | **Water, energy and Environment Center/ The University of Jordan**



SESSION (36)

Water Systems- Desalination

Mohammad Faris Al Obeid
Technical Expert
Green Path Solutions

Mohammed Ahmed
Researcher in Water and Environment Technologies
Aqua Eng. & Consulting Office

Ayman Rawajfeh

CHAIRMAN & KEY SPEAKER:

Mohammed Rasool
Chief Technology Officer (CTO) | **Saudi Membrane Distillation Desalination (SMDD) Company Ltd**

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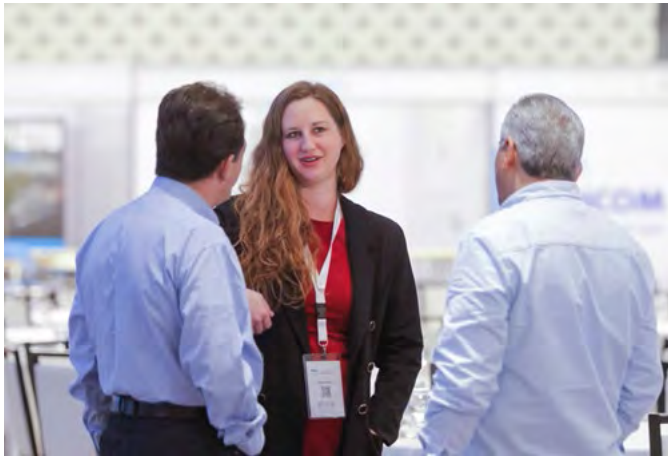


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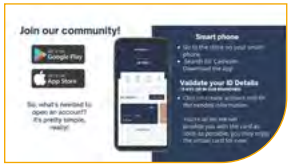


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REDUCT
www.reduct.net

Make sure to stop by their booth and say hello!

BOOTH #33

Reduct NV

Reduct's Utility Mapping Solutions

Inaccurate utility locational data is one of the main causes of utility strikes. In 2021, this has led to an estimated $30 billion societal cost due to delays and damages to underground utilities in the USA alone, according to The 2021 Damage Information Report Tool (DIRT) Report released in October by the nonprofit Common Ground Alliance.

Since its inception in 2001, Reduct NV (www.reduct.net) has launched a range of Gyroscopic Pipeline Mapping solutions to help reduce the risk of utility damage. The smallest system, named ABM-30 can map a 1 ¼" duct, the standard duct trade size for data cables. Standard centralized solutions such as the ABM_90 and DR-4 are available up to 40" pipe ID and when fitted with invert wheel sets, larger diameter pipes can be mapped as well.
Reduct's user-friendly gyro-mapping solutions provide not only accurate 3D well. Efficient operational procedures enable a crew of two to complete the mapping of a 1000 meter pipe segment within the hour.

Gyro-mapping Explained

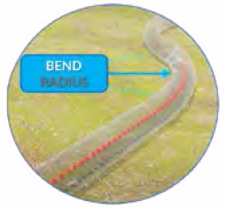
Gyroscopic pipeline mapping is a technique used within the utility pipeline construction and survey sectors to provide 3D geographical information of underground utility pipes and ducts. As an autonomous Orientation Measurement Unit (OMU) is passed through a pipe or duct, a range of inertial sensors capture its change in heading, inclination, and acceleration at high frequency. The resulting 3D profile is linked to the start- and endpoint coordinates of the pipe segment and an as-built map is created which can be immediately uploaded into any GIS-platform.

Gyro Mappings Data Output

Gyroscopes, accelerometers and similar inertial sensors lie at the heart of gyroscopic pipeline mapping technology. Imagine that the probe is an arrow that is perfectly aligned with the orientation of the pipe. **One hundred times per second** the sensors record the change in the direction in which the arrow is pointing. Two integrated odometers record the distance traveled per sample, thus giving each sample a length. Place all samples in sequence and there you have it: an accurate 3D profile of the pipe segment mapped. The high rate of data points taken by the probe, may not be essential to create a line in a GIS platform, but it enables Reduct's X-View software to perform bend radius and inclination assessment calculations at any point of the mapped segment.

Bend Radius

Reduct's high accurate bend radius data is used to verify if the pipeline has been constructed according to the specifications mentioned in the tender. Bends that do not meet the specifications have a higher chance of rupture.



Inclination assessment

Only gyro systems provide such high resolution to identify even the smallest changes in inclination in a gravity sewer. Standard output compares the measurement results against new-build grade specifications or any known tolerance classification

Fiber Optic Gyros (FOGs) versus Micro-Electro-Mechanical Systems (MEMS) Gyros

An evaluation for use in Underground Pipeline Mapping probes

Introduction

Over the last two decades the demand for, and availability of, underground pipeline mapping probes has witnessed a steady rise. Almost all autonomous underground mapping probes use inertial navigation technology and dead reckoning principles. Inertial navigation technology typically contains a range of gyroscope, accelerometers, magnetometers and other relevant sensors and electronics. When used in underground pipelines the probe does not have the possibility to verify its position by means of GPS or similar positioning system, so the *long-term stability* of the technology used is very important to understand.

This paper explores the two main technologies used for underground mapping probes: Fiber Optic Gyros (FOGs) and Micro-Electro-Mechanical Systems (MEMS) Gyros.

About FOGs and MEMS

The quality of measurement results, in the case of underground mapping defined as accuracy of the mapped profile, is highly dependent on the quality of the sensors used, and in particular the type and quality of gyroscope. In addition to the quality of the gyroscope used, the data-processing software is a second key element obtaining high accuracy levels, but this will not be part of the topic of this paper.

Fiber Optic Gyros (FOGs)
FOGs use the Sagnac effect, which utilizes counter-propagating optical beams and interferometry to measure rotation. FOGs have solid state, all fiber or hybrid fiber construction.

Micro-Electro-Mechanical Systems (MEMS) Gyros
MEMS gyros use the Coriolis Effect, which is based on vibrating mass deflection resulting from rotation. MEMS can be quartz or silicon based in construction.

The quality of the gyroscopes determines the *long-term stability* of the probe's measurement. The better the long-term stability, the higher the accuracy. And the higher the accuracy, the longer the length of pipe that can be measured.

Key Gyro Performance Factors:

1. **Noise or Angle Random Walk (ARW)** - The average error that occurs as a result of high frequency white noise. Major contributors to random noise are the active elements of the gyro such as the laser diode and photo diode in a FOG, and the silicon or quartz vibrating beam and detection electronics in a MEMS gyro.
2. **Bias Offset Error** - A stationary gyro can incorrectly register some rotation; this is called bias offset error. Its deviation from zero is typically given at 25°C for an ideal environment (i.e. no temperature change, vibration, shock, or magnetic field applied). The offset error must be calibrated periodically.
3. **Bias Instability** - Instability of the bias offset at any constant temperature and ideal environment. The instability scale must be calibrated periodically.
4. **Temperature Sensitivity** - Bias offset and absolute scale factor (SF) of a gyro will vary slightly with temperature changes. This can be improved with calibration.
5. **Shock and Vibration Sensitivity** - Shock and vibration can be modeled as noise and bias offset in the gyro output, causing inaccuracies too large to accommodate. These inaccuracies are not easily improved with calibration. FOGs are inherently not sensitive to vibration due to using a light source whereas MEMS use a mechanical structure and are more prone to vibration sensitivity.

Overview of GYRO FOG vs. MEMS Key Performance factors

Key Performance Indicator	Units	FOG	MEMS
Input Rate (maximum)	± °/sec	± 300	± 300
Angle Random Walk (25°C)	°/h/√Hz	≤ 3	≤ 9
Bias Offset (25°C)	± °/h	± 10	± 250
Bias Instability (constant temp)	°/h, 1σ	≤ 0.5	≤ 1
Bias Full Temp (≤ 1 °C/min)	°/h, 1σ	≤ 1	≤ 10
Bias Vibration Rectification	°/h/grms	≤ 0.5	≤ 1

Typical applications for FOGs and MEMS

FOGs offer high performance in the five key parameters vital for (underground) navigation, control, and stabilization. These are low angle random walk; small bias offset error; excellent bias instability (low drift); reduced temperature sensitivity; and reduced shock and vibration sensitivity. FOGs are solid state sensors which makes these gyros extremely robust and reliable.

MEMS gyros offer smaller size and weight and less power consumption than FOGs. MEMS are capable of withstanding high non-operating shock levels. The weaknesses of MEMS based inertial systems lie in critical performance parameters such as higher angle random walk/noise, which is an extremely important performance criterion in stabilization and positioning systems. In addition, MEMS gyros have higher bias instability, which results in a degraded (underground) navigation or stabilization/pointing solution. Thermal sensitivity of MEMS gyros and inertial systems also impacts their bias and scale factor performance; these attributes are critical in both stabilization and navigation applications.

The table below provides a general breakdown of the type of gyro best suitable for typical applications:

Gyroscope Grades Based on Bias Stability		
Performance Grade	**Bias Stability**	**Gyro Type**
Consumer grade	30-1000°/hr	MEMS (low end)
Industrial grade	1-30°/hr	MEMS (high end)
High-end Tactical	0.1-1°/hr	FOG (non-military grade)
High-end Navigation	0.01-0.1°/hr	FOG (non-military grade)
Strategic	0.0001-0.01°/hr	FOG (military grade)

Applying FOGs and MEMS in Pipeline Mapping Systems

As mentioned earlier, the overall accuracy of mapping and underground pipeline is highly dependent on the type of gyro used and the sophistication of the data-processing software. The *Angle Random Walk* and *Bias Offset* determine the accuracy (or drift) of a gyro over time.

Since FOGs score significantly better than MEMS for these key performance factors, FOG-based systems can measure significantly longer pipe segments than MEMS-based systems. Operational procedures, such as multiple measurements, may improve accuracy by applying the laws of statistics, but given the current state-of-the-art of MEMS, a maximum way-point spacing (or pipe length) of 300 meters is advisable for MEMS-based mapping systems. FOG systems, however, currently require a maximum waypoint spacing of 1,500 meters.

Regardless of which technology is used, periodic re-calibration is a very important factor for maintaining the systems' accuracy. Non-calibrated systems can *appear* to be accurate, for example by having a small spread between multiple measurements, but extensive tests have proven that the mapping result, despite the high repeatability, degrades over time.

Conclusion

The fundamental mechanical, data-processing and operating principles for FOG-based and MEMS-based pipeline mapping systems are similar so on that basis they are hardly distinguishable. Technically, however, only FOG based systems provide the accuracy required for pipe segments up to 1,500 meters in length. Both FOG and MEMS require periodic re-calibration to maintain accuracy.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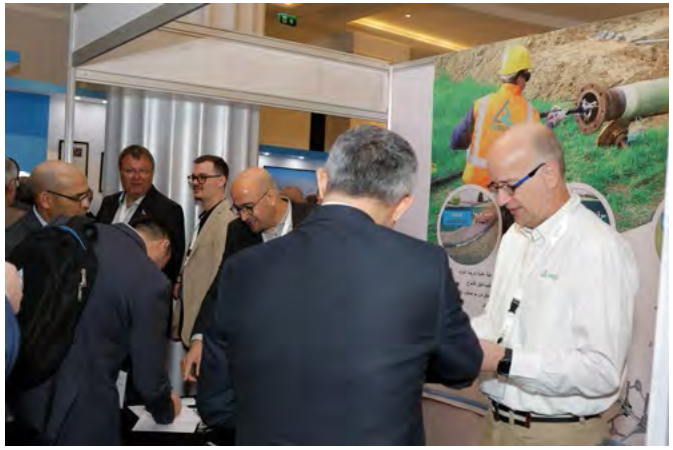


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HydroTech
no risk, get it mapped


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2ND TRENCHLESS ARABIA CONFERENCE & EXHIBITION

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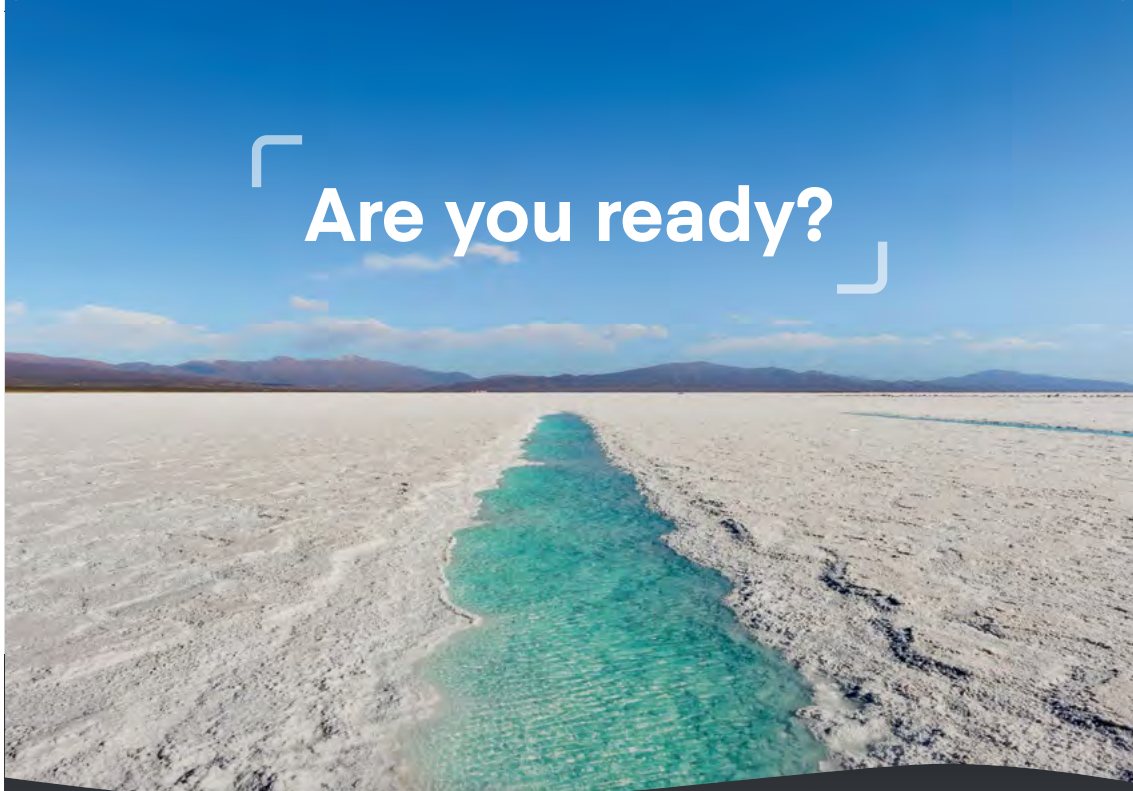

Climate change, population growth, and water scarcity are creating new challenges, and desalination is becoming an important alternative to traditional freshwater resources.

DUPLEX – SUPER DUPLEX

SAER is ready to face these new scenarios with a strong and fast answer: a full range of high efficiency end suction, close coupled, high pressure, split casing and submersible pumps and motors in **DUPLEX** and **SUPER DUPLEX**, available with one of the **best delivery time** on the market, thanks to the **italian** production.

Let's improve the water management in civil, industrial, marine and agricultural water services and rest assured with SAER quality.

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BOOTH #35

Wilo SE Representative Office

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WILOPARK

OUR NUMBER 1
DIGITAL LOCATION

180,000

square metres is the size of the construction project – about the same as 26 football pitches.

2,000

employees work at the Wilopark.

4,000

solar modules save 3,500 tons of CO2 every year.

166

Wilo pumps are used throughout the Wilopark.

ABOUT WILO

The Wilo Group is one of the **world's leading premium providers of pumps and pump systems** for the building services, water management and industrial sectors.
Today, Wilo has **8,200 employees** worldwide, and produces around **10 million pumps** annually.

Middle-East and North Africa

Dubai is one of the world's leading digital hubs. As such, it offers the Wilo Group an excellent opportunity to designate it as its **headquarters** for the **Middle East and North Africa Region**.
The **MENA** Region is represented by **Platforms** based in **Lebanon**, **Egypt**, **Morocco**, and the **UAE**.

Wilo Levant Platform

The **Wilo Levant Platform** was officially inaugurated in **2019**, with the **main office** and **training academy** located in **Lebanon**, and a **representative office** managing the operations of **Jordan** and **Palestine** located in **Amman, Jordan**.

"The 25 – Years history of Wilo Lebanon was the key role of the subsidiary in the international strategy of the Wilo Group. Our excellent performance throughout the years and the promising business environment in Levant area will turn the platform into a center of excellence."

Ayman Nassar
Managing Director, Wilo Levant Platform

CLIMATE LEADERSHIP

Wilo_One of **"50 Sustainability & Climate Leaders"** Worldwide

Winner of the **"German Sustainabilty Award 2020"** in the **Climate transformation** field.

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HYDROGEN:

THE EMERGENCE OF A GLOBAL MARKET

From industry and transportation to heating, our society requires **green energy** in every area of life. this demands a solution that is both **Co2-free** and capable of being stored and transported: **hydrogen**. It has vast potential as the energy source of the future. And Wilo has the potential to be a global player for the generation, storage, **distribution and use of hydrogen.**

"Hydrogen technologies and systems have been defined as a value chain of strategic interest, meaning that Wilo's solutions in this area are also systemically important.
In future, our products and systems will make an essential contribution to the generation, distribution and utilisation of blue and green hydrogen."

Oliver hermes
President & CEO, Wilo Group

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RELEVANT, DIGITAL, SUSTAINABLE

SMART CONNECTED WASTEWATER PUMPING SOLUTIONS

Wilo-Rexa SOLID Q with Nexos Intelligence

- Anti- Clogging detection with automatic flush sequence.
- Intelligent control function for energy efficiency optimization.
- Integrated, redundant pump control of up to units.

Nexos Intelligence

- Prevents alarm states
- Web access independent of the device
- Optimized flow rate for reduced operating costs and longer system lifespan
- System access at all times
- Back-up function in event of communcation breakdown
- Encrypted data technology

Wilo-Rexa SOLID Q

NEXOS INTELLIGENCE

Intelligent Anti Clogging Functionality

Adjustable parameters for detection of clogging and automatic cleaning sequence designed for the specific hydraulic type.

Automatic Slave Switch Over

Automatic takeover of the master functionality by any pump in case of a malfuntion.

Intergrated Frequency Controller

Automatic parameterization & comfortable control of the Frequency converter by the web server

Integrated Multi Pump Controller

Control of up to 4 pumps included, no further control device required

Intelligent Energy Efficiency Optomization

Automatic detection of the system's optimal speed with dynamic adjustment to variable

Technical View

Sensors: Packages with DDI

Concept

Advantages

wilo

OPTIMIZED WATER SOLUTIONS

JORDAN

As climate change accelerates, **wastewater reuse** is becoming more necessary.
Wilo Levant Platform was awarded the **equipment's supply** for the **rehabilitation of 3 wastewater treatment plants in Jordan**, a project contributing towards the mitigation of climate change in the wastewater sector and improving environmental circumtances in the plant area; hence, **supporting Jordan's Vision 2025** for achieving water security in the Kingdom.
We were part of **upgrading the sludges lines** and **optimizing energy consumption** that will lead to an **improved quality** of the treated effluent to **enable water reuse** and **increase** the availability of **water irrigation** in the area.
Irbid station alone will **cut green house emisions** by **6,600 metric tons** annually.

Our Solution consited of:

86 Wilo-EMU FA (customized submersible pumps)
11 Wilo-Rexa PRO (configurable submersible pumps)
10 Wilo-Rexa Block (dry sewage non-clog pumps)
10 Wilo- medium to low speed Mixers
4 Wilo-VeroLine-IPL & DL (heat recovery and circulation)
8 Wilo-EMU RZP (internal recirculation pumps)

"Wilo Levant Platform business activities in the Levant region aim to optimize synergy and energy efficiency in the water sector. Jordan's challenges and limited water resources are key for extensive care about the country's integration and adaption into more efficient, reliable, and digital solutions for a sustainable development."

Mohammad Abushanab
Country Manager, Wilo Rep Office Jordan, Wilo Levant Platform

ASK ABOUT OUR SERVICE PACKAGES

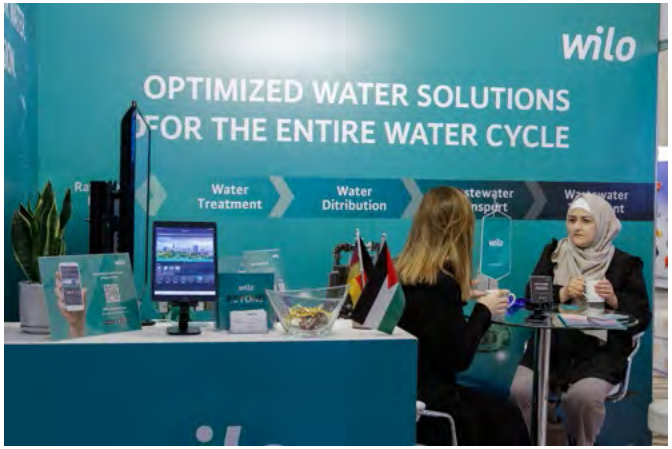
Your Needs, Our Tailor-Made Solutions

Three different contract models of WiloCare:

-> Basic Model
-> Comfort Model
-> Premium Mode

Depending on your requirements, all risks and costs of maintenance, call-outs and/or spare parts can be covered.

-> We maintain your equipment on a regular base
-> We take over the operation and service of your pump/system
-> We control your equipment remotely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FOR THE ENTIRE WATER CYCLE
Water Treatment
Water Ditribution


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DECODING THE FUTURE
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BOOTH #14

Vivavis Middle East DMCC

VIVAVIS

Secure and automated processes for water utilities and waste water management

VIVAVIS provides comprehensive and holistic solutions for the entire water network in cities and their surrounding regions. Solutions from VIVAVIS enable operators to monitor and manage their water networks across a whole range of processes – from water sources to consumers.

Apart from offering solutions in plant automation, telecontrol, IoT, SCADA and advanced network management platforms, the combined solution from VIVAVIS become even smarter thanks to the artificial intelligence (AI) solution from our expert brand eoda. The processes in water networks are automated, monitored and controlled, but thanks to the new AI technology, the water networks are now converted into intelligent networks. Whether you are dealing with demographic or geographic data, water data (flow rate, pressure, water levels, water quality, energy, consumption, leakages etc) or network data (pipelines, installations etc.): to ensure reliable forecasts, we combine different sources of information and analyse them by means of modern machine learning methods. With this approach we provide our customers with added value in various areas of water management.

Our solutions for you

In the field of intelligent water networks, we offer you consultancy services and solutions for the following tasks:

- Monitoring of water resources (dams, rivers, wells etc.)
- Monitoring of water transmission networks
- Monitoring of supply and distribution networks and installations (reservoirs, pump stations, chambers etc.)
- Monitoring of the water quality (chlorine, turbidity etc.)
- DMA – District Metered Area management
- Energy management
- Management of leakages and water losses
- Smart metering
- Advanced Network Management

We provide full-scale and comprehensive support, from data management and analysis to the presentation of data via an intuitive dashboard.

Parts of this solution

Our solutions are based on the following well-proven and powerful tools and components:

- HIGH-LEIT SCADA system
- RTUs from the ACOS telecontrol series
- Protocol Converter/Gateway
- Asset Management – 360° AM
- Data Science automation platform – YUNA
- Advanced Network Management – NPM
- Smart Metering platform – IDSpecto.DAYOS
- IoT Gateway device – enQube
- LoRa®*,MQTT, NB-IoT, LTE450 Gateway (CU71A), IoT Hub

** The LoRa® Mark is a trademark of Semtech Corporation or its subsidiaries.*

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GIS
ERP
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MNF Minimum Night Flow Analysis
Water Balance
In Compliance With International Water Association (IWA)


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NIVUS GmbH

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Digital, networked measurement technology solutions for water, sewage and environmental technology

nivus campus

We provide seminars, training and further education on all relevant topics and tasks

nivus sensors

Our sensors measure flow, level, water quality or particle concentration

nivus monitoring

Complete metering services as an all-in-one package from a single source

nivus connect

Plug & Play transmitters, mobile data loggers and IoT gateways

nivus sphere

measure analyse optimise

nivus services

From project planning and application-specific design to control cabinet construction, commissioning and regular maintenance

nivus data portal

Platform solutions for the visualisation, processing and forwarding of generated data

nivus data analysis

With this service, we ensure that you receive resilient data with our solutions





We are one of the technology leaders in the flow measurement; a worldwide developer, producer and supplier of measurement equipment for water industry. Our product portfolio includes accurate systems for flow measurement, flow velocity detection, level measurement, pressure measurement and the measurement of water quality.
We also provide software for acquisition and logging of data and for the analysis of measurement results. A comprehensive process control system completes our program. Contact us to find out more on how we can help you with our solutions to your applications. **www.nivus.com**

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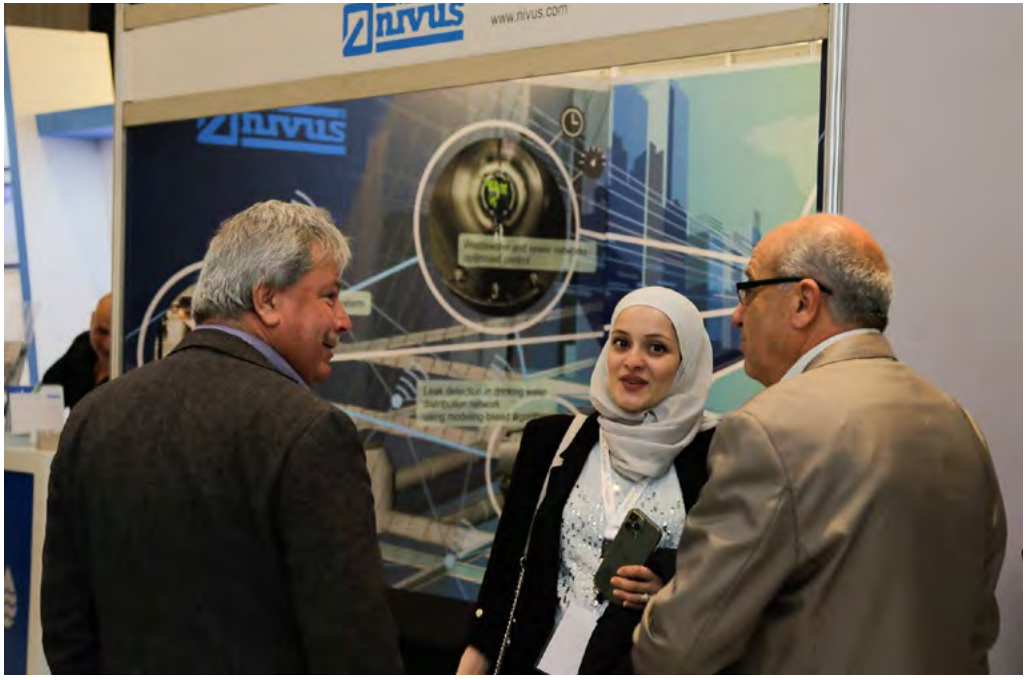
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BOOTH #36

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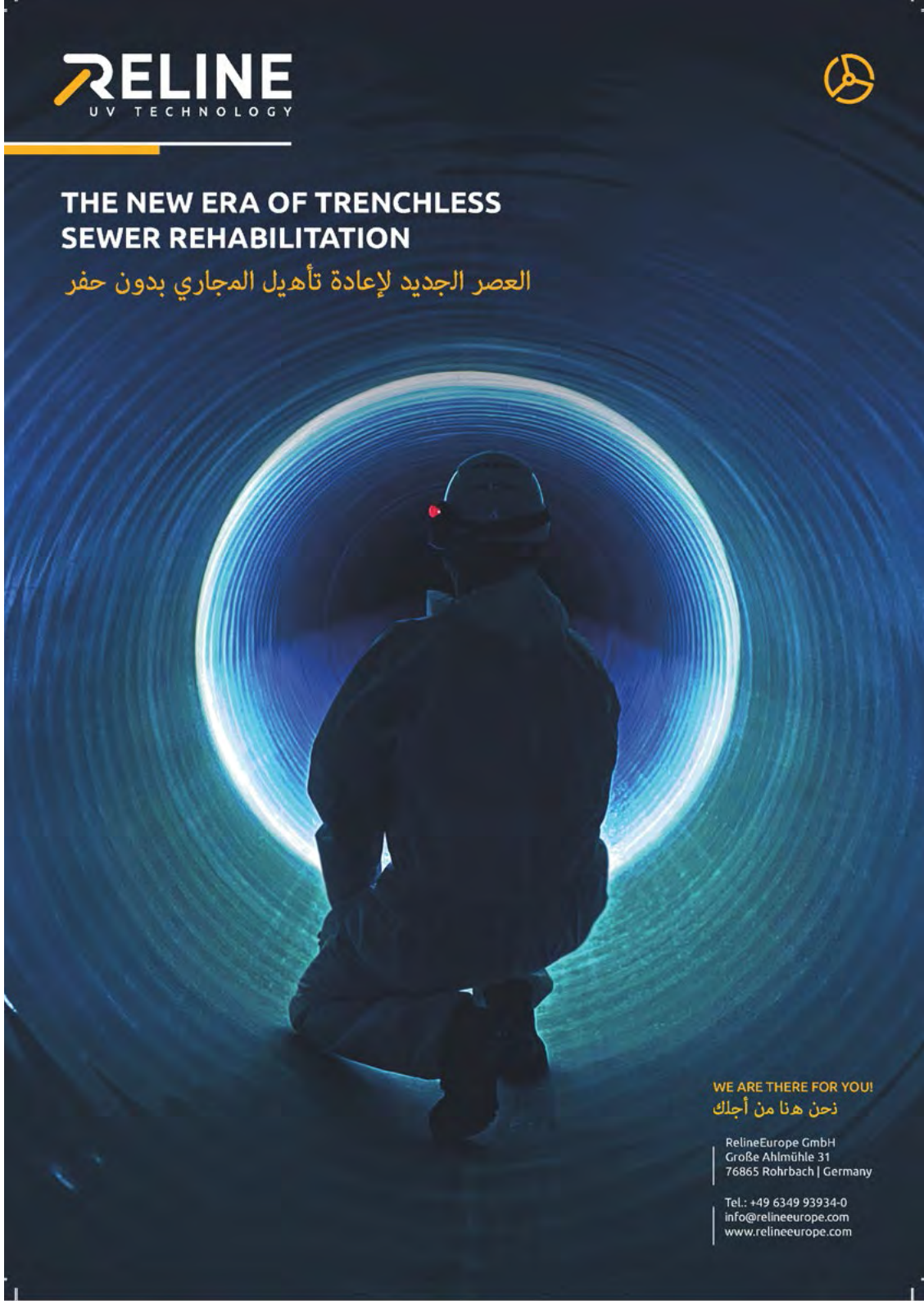
THE NEW ERA OF TRENCHLESS SEWER REHABILITATION

العصر الجديد لإعادة تأهيل المجاري بدون حفر



WE ARE THERE FOR YOU!

نحن هنا من أجلك

RelineEurope GmbH
Große Ahlmühle 31
76865 Rohrbach | Germany

Tel.: +49 6349 93934-0
info@relineeurope.com
www.relineeurope.com

RELINE | Press Release November 2022

RECORDSETTING REHABILITATION PROJECT IN FINLAND

Rohrbach (DE) / Turku (FI), November 2022 : Finland's oldest city became the stage for a new record setting trenchless pipeline rehabilitation project: 1,000 metres of old pipe were successfully rehabilitated in just 40 days using 10 Alphaliner1800H with a total weight of 212 tonnes.

The sewer rehabilitation company EEROLA OY is well established on the Finnish market since almost four decades. With more than forty employees, the family-owned company rehabilitates over 40 kilometres of old pipe annually, and yet the project in Finland's former capital, Turku, was a special case in their history. Not only the meticulous planning was a challenge. In particular, a reliable partner had to be found who could not only produce and deliver GRP liners with the appropriate requirements, but also provide and operate the respective equipment for installation.

Complex projects require trusting and reliable partnerships

"We knew that if we were going to do this complex job, it would only work with a partner who had experience in both fields. Producing large-diameter GRP liners in the shortest possible time and also being able to supply the equipment that is 100% compatible with these," says Petteri Eerola of Putkistosaneeraus (PSE) EEROLA. "With RELINE as our supplier, we knew that they were capable of providing us with meticulous and expert support in all the planning and preparations. This is the only way to implement a project of this complexity."

212 tonnes of GRP liner installed in the shortest time ever

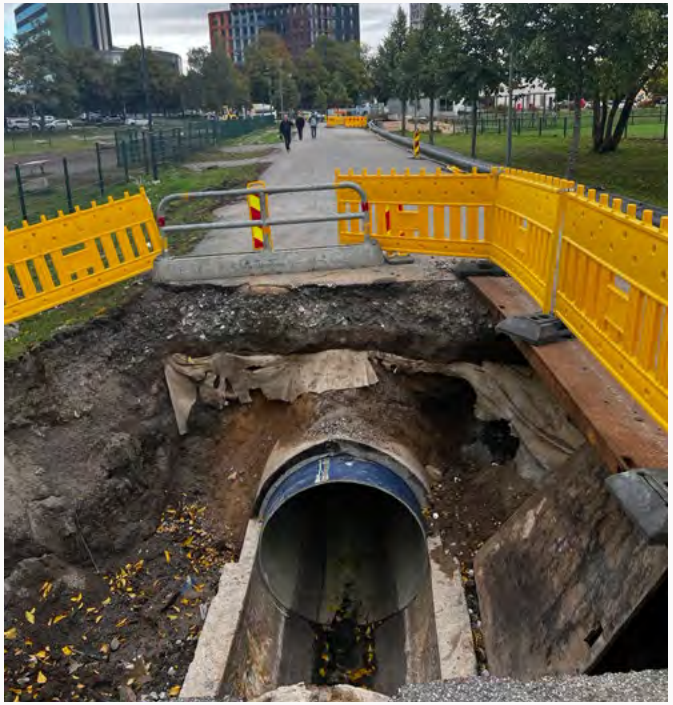
Turko, former Finnish capital and today a pioneer of sustainable and ecological urban development, was the scene of this equally sustainable and environmentally friendly recordsetting project, which started at the beginning of October 2022. A total of 10 Alphaliners with a total length of 1,000 metres were installed in the south-western Finnish metropolis. Particularly remarkable were the dimensions, lengths and weights of the GRP liners, which were deliberately ordered with peroxide-free resin: 10 Alphaliner1800H with a total weight of 212 tonnes were produced, loaded and installed within 40 days. The DN 1600/ WT 18.4 and DN1800/ WT 20.5 Alphaliners were delivered safely and on time to the site 2,000 km away in variable, reusable, timber-clad metal racks.

"In each week of the project, around 35 tonnes of Alphaliner1800H were produced and loaded at our factory in Rohrbach - and that without affecting further deliveries to our other global customers. We attach great importance to this!", says Philipp Bergman, Area Sales Manager of RelineEurope GmbH. "It is important in such extraordinary projects that we are involved in the preparations of the installing companies and can also provide advice and offer implementable solutions from here as well as on site - practically as 'construction site consulting'." Another successful element of this project is, of course, the use of our UV technology, which is specially adapted to our GRP liners. There, every piece of the puzzle is individually matched."

First stage of project successfully completed in 40 days

In addition to the folding packer from RELINE, an in-house developed conveyor belt with folding device and the REE4000 UV curing system were used on site. This allowed a curing speed of 25 cm/min to be achieved for the Alphaliners with a diameter of DN1600 and a wall thickness of 18.4 mm, and the first stage of the project in Turko was successfully completed within the specified time frame.

Facilitated insertion of the Alphaliner1800H DN 1800 by using a conveyor belt with folding device.



Facilitated insertion of the Alphaliner1800H DN 1800 by using a conveyor belt with folding device.

As far as the eye can see: a total of 1,000 metres of old pipe rehabilitated.

Press Contact

Carla Schmidt, Director Marketing –

RelineEurope GmbH

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76865 Rohrbach, Germany

marketing@relineeurope.com

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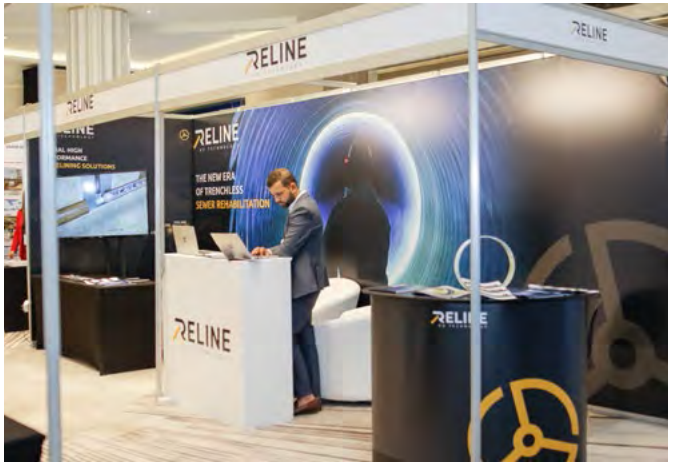
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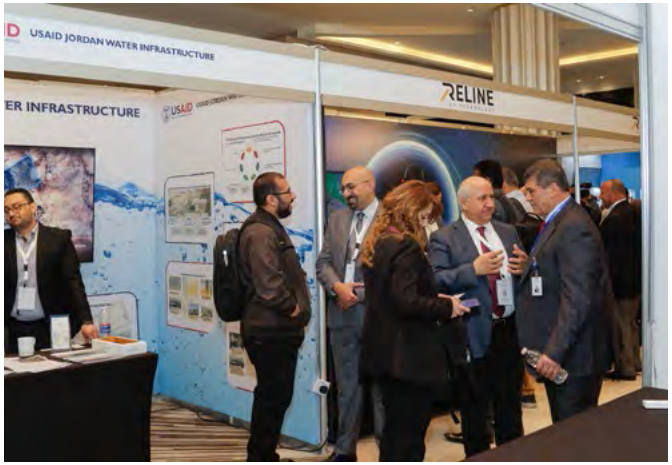
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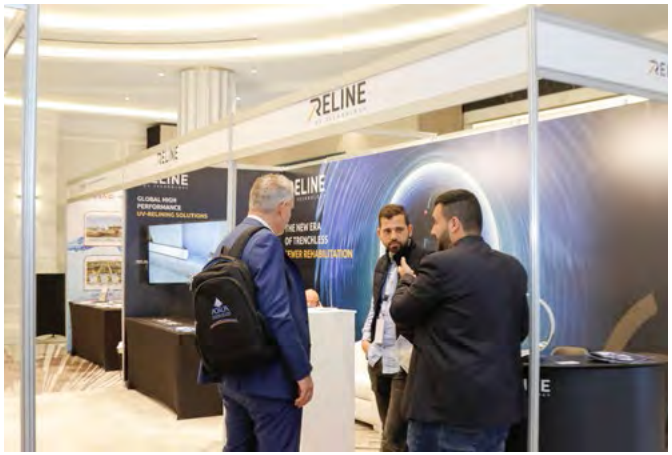
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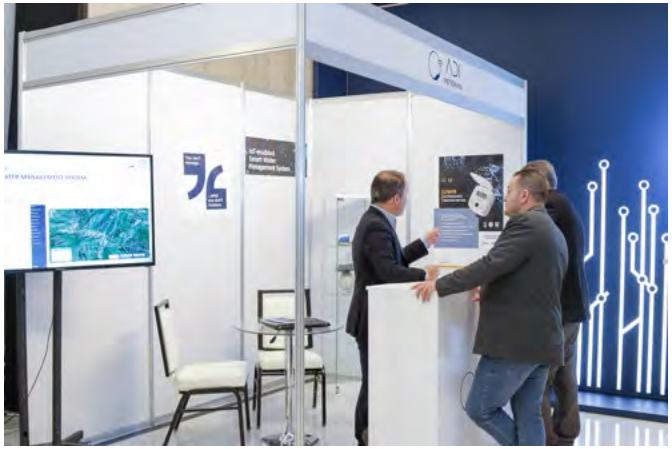

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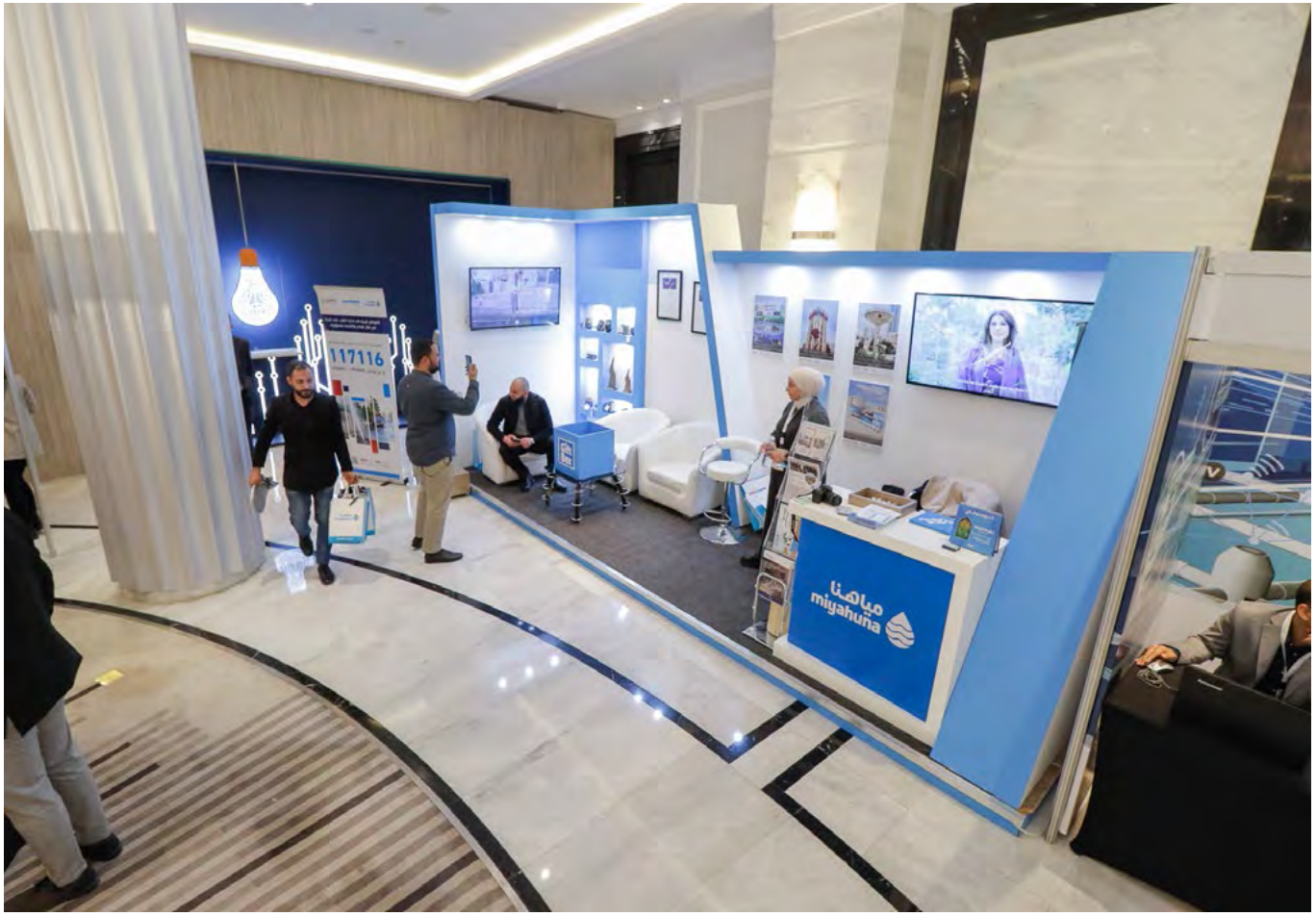
BOOTH #5

Miyahina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Gift Box


DUBAI EXPO 2021
كل نقطة بحرص
لنحافظ عليها


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BOOTH #38

USAID Jordan Water Infrastructure


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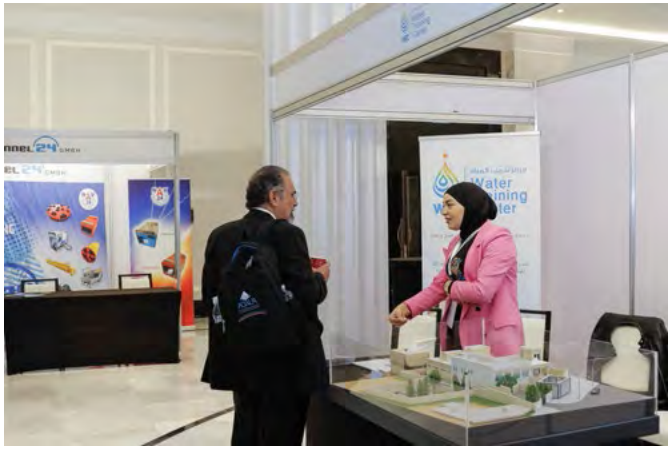
BOOTH #16

GIZ - Jordan









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BOOTH #40

Stockholm International Water Institute (SIWI)


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6th ARAB WATER WEEK AND 2nd TRENCHLESS ARABIA

CONFERENCE & EXHIBITION

أسبوع المياه العربي
Towards Smart & Agile Water Utilities | نحو مرافق مياه ذكية ورشيقة

IBG HydroTech®
www.ibg-hydro-tech.de

Make sure to stop by their booth and say hello!

BOOTH #34

IBG HydroTech GmbH


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TUNNEL 24 GMBH
www.tunnel24.com

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BOOTH #10

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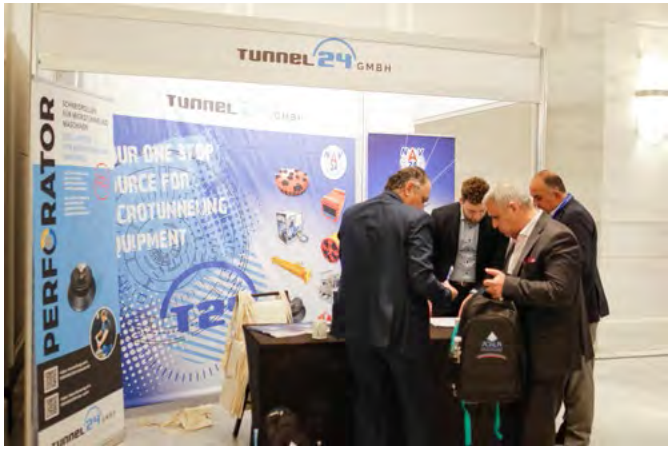
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clean water for life
www.cembrane.com

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BOOTH #42

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TRACTO

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BOOTH #41

TRACTO-TECHNIK GmbH & Co. KG


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RAMMERS
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SYSTEMS
ADVANCED TRENCHLESS TECHNOLOGY


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shepherd
www.shepherd365.com

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BOOTH #43

Shepherd


Beyond HR


TALENT MANAGEMENT SOLUTION


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مياه اليرموك
yarmouk water

www.yw.com.jo

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BOOTH #4

Yarmouk Water Company


Water Operators' Partnership (WOP)
between Yarmouk Water Company (Jorda
World Waternet (Netherlands)
to improve service delivery, operational effi
and increase access to improved sani
clean, sufficient and safe water
What are WOPs?
ميـــاه
اليرمـــوك
yarmouk water


waternet
Water Operators' Partnership (WOP)
between Yarmouk Water Company (Jordan) and
World Waternet (Netherlands)
to improve service delivery, operational efficiency
and increase access to improved sanitation an
clean, sufficient and safe water.
Jordan
2020 - 2023
Dutch Ministry of Foreign Affairs
(via the Embassy of the Kingdom
of the Netherlands in Amman)
Dutch Regional Water Authority
Rivierenland, Water Authority
Jordan, Jordanian Ministry of

ACWUA

AWW MAGAZINE

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