

# Desalination for the Environment – Clean Water and Energy

## Alfândega Congress Centre, Porto, Portugal

### Conference Programme

#### Sunday 27 April 2025

8.30–17.30 Registration

9.00–18.00 Exhibition set-up

9.00–13.00 **Workshop on Greener Desalination: Case Studies from Large-Scale SWRO for Sustainable Water Supply to Brine Valorisation for a Circular Economy**

**Moderator Daniel Frank, Senior Adviser at DECHEMA**

9.00 **Part I. Large-Scale SWRO**

9.00 Introduction. *Daniel Frank, DECHEMA*

9.10 **184** Desalination technology conversion: GCC case study. Part I: Overview and key drive  
*Sergio Casimiro (ACWA Power), Hugo Costa, Hassan Almsaeed, Justin Robert*

9.20 **185** Desalination technology conversion: GCC case study. Part II: Offshore design and environmental impact reduction

*Hugo Costa (HR Wallingford), Sergio Casimiro, Hassan Almsaeed, Justin Robert*

9.35 Case studies from large-scale SWRO for sustainable water supply, *Domingo Zarzo Martinez, SACYR*

9.55 279 Seawater desalination plant in the Algarve: enhancing water resilience and security  
*Adriana Espanha, Claudia Dimas, Marisa Viriato, Pedro Ramos, Ricardo Estigarribia, Rui Sancho (Aguas do Algarve)*

10.15 Brief overview on progress toward sustainability in Spain's desalination plants  
*Domingo Zarzo Martinez, AEDyR President*

**10.20 Panel Discussion**

**10.50–11.10 Coffee break**

**11.10 Part II. Brine Valorisation**

11.10 Key challenges and opportunities for sustainable brine valorization in chemical industry  
*Yuliya Schießer*

11.30 254 Advancing industrial brine concentration: pilot demonstration and evaluation of a novel high pressure process with energy recovery  
*Christine Kleffner, Yuliya Schiesser, Jochen Henkel, Eric Kadaj, Angel Abajas, Gerd Braun*

11.50 42 Maven brine mining plant – 1st commercial OARO project in the world  
*Ilker Akbas, Georg Herborg, Francisco Jimenez-Castellanos*

12.10 51 Innovative testbed for desalination brine valorisation: circular economy and NF-OARO synergies from Desal+ Living Lab  
*Ángel Rivero Falcón, Yanira López López, Baltasar Peñate Suárez, Noemi Melián Martel*

12.30 Building the business case for industrial brine valorization  
*Christos Charisiadis, Brine Consulting*

**12.40 Panel Discussion**

**13.10–14.00 Lunch**

**18.30–20.00 Welcome reception – Noble Room, Alfândega Congress Centre. Sponsored by Águas e Energia do Porto**

**20.00 Young Professionals Networking Evening – departing the Alfândega Congress Centre at 20:00 for the Rua das Flores district.**



NEOM نيوم

**14.00–17.00 Water Innovation Center on Brine Valorization Workshop at EDS**  
**Moderator: Nikolay Voutchkov, NEOM**

14.00 Introduction

*Noura Chehab and Nikolay Voutchkov, NEOM*

14.20 Nanofiltration system – alternative configurations and performance  
*Salman Arab, NEOM and Xiaofei Huang, Hydranautics*

14.40 Bivalent mineral processing system  
*Christopher East, Neom WIC*

15.00 Reverse osmosis and energy recovery  
*Xiaofei Huang, Hydranautics, Casey Bly, FEDCO*

**15.20 Coffee break**

**15.35** Membrane concentration and crystallization  
*Keith Lampi, FTS, Nikolay Voutchkov, NEOM*

**15.55** Next steps in brine valorization system testing  
*Nikolay Voutchkov, NEOM*

**16.15 Questions, Answers and Discussions**

**17.00 Workshop Adjourned**



## Monday 28 April 2025

**8.00–09.00 Registration**

**9.00–10.20 Official opening of the conference and exhibition**

- 9.05 Introduction. Professor João Crespo
- 9.10 Special Guest of Honour, Mayor of Porto Rui de Carvalho de Araujo Moreira
- 9.20 Olga Sallangos, President of the European Desalination Society
- 9.25 Eli Oklejas, FEDCO President, Titanium Sponsor
- 9.30 Emilio Gabbrielli, Author of “*The 7000-Year Story Of Sea Water Desalination*”
- 9.35 Keynote Address. Professor Antonio Carmona Rodrigues, President of Aguas de Portugal
- 9.50 Keynote Address. Professor Menachem Elimelech, Rice University, USA. Is seawater desalination a sustainable solution to global water scarcity?
- 10.05 Miriam Balaban will announce and award the Sydney Loeb Award Winner

**10.20–10.50 Coffee Break**

**10.50–12.30 Panel session “Best Practices of PPP in the Water Sector”. Organised in collaboration with the Saudi Water Partnership Company and the Portuguese Water Partnership**

**Moderators:** *Mr. Sulaiman Rafat Turki*, Chief Strategy & Development Officer of SWPC, and *Professor José Saldanha Matos*, President of Portuguese Water Partnership

**Panellists:** *Mr. Ramzi S. Azar*, Chief Strategy Officer of Alkhorayef Company; *Ahmad AlAsam*, VP, KSA Water Projects at ACWA Power; *Eng. Adnan Buhuligah*, Deputy CEO of Aljomaih Energy & Water; *Pedro Bastos*, O&M Performance Director at TAWZEA

**12.30–13.30 Lunch**

**13.30–17.30 Technical sessions**

**17.30–19.00 Poster session with drinks in the Exhibition Area.**

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Monday afternoon 28 April 2025

	<b>Session 1 INFANTE HALL</b> <b>Electromembrane Technologies</b>	<b>Session 2 D. MARIA</b> <b>Brine Valorisation I</b>	<b>Session 3 D. LUIS</b> <b>Modelling and Simulation</b>	<b>Session 4 MIRAGAIA</b> <b>Biofouling Control I</b>	<b>Session 5 S. JOAO</b> <b>Intake and Outfall Marine Systems</b>	<b>Session 6 PORTO</b> <b>Wastewater Treatment and Water Reuse I</b>
<b>13.30</b>	<b>197</b> Performance of a containerized multistage variable power electro dialysis desalination system <b>Jonathan Bessette, Shane Pratt, Benjamin Judge, Amos Winter</b>	<b>121</b> Cutting-edge technology for the selective separation of monovalent salts from seawater brine <b>Noura Chehab, Nikolay Voutchkov, Mohammed AlSindi</b>	<b>19</b> PROTON®: A tool for modeling and simulation of membrane technology performance <b>Gabriele Brummer</b>	<b>134</b> NADES as green cleaning agent for control of biofouling in RO membrane systems <b>Andreia Farinha, Kees Theo Huisman, Lamyia Al Fuhaid, Caroline Crisel, Geert-jan Witkamp, Johannes Vrouwenvelder, Bastiaan Blankert</b>	<b>160</b> Resilient marine works: survey and marine modeling strategies for successful coastal desalination <b>Mario Valente, Filipe Vieira</b>	<b>131</b> Wastewater treatment membranes: main issues and failures <b>Nuria Peña Garcia, Javier Rodriguez, Mike Sinfield, Fernando Del Vigo Pisano, Daniela Vidal</b>
<b>13.50</b>	<b>112</b> Flow electrode capacitive deionization: a path toward scalable and sustainable desalination solution <b>Hafiz Muhammad Saif Saleem, Joao Crespo, Sylwin Pawlowski</b>	<b>159</b> Operation and maintenance considerations of an innovative 1200 m3/d brine valorization system <b>Stasinios Chiotakis, Nikolay Voutchkov, Noura Chehab</b>	<b>31</b> Optimization of complex RO system design using AquaGRID <b>Harish Warsono, Yoshiyuki Kawashima</b>	<b>119</b> Biofouling monitoring in SWRO systems through microbial loading quantification <b>Núria Zamorano-López, Raquel Escorihuela, Olga Ferrer Mallén, Jorge J. Malfeito</b>	<b>170</b> Hydraulic design of marine intake systems: optimizing performance and reliability <b>Mario Valente, Hugo Costa</b>	<b>211</b> Sustainable carbonaceous materials-based catalytic membranes for organic wastewater treatment: Progress and prospects <b>Yongtao Xue, Jia Wei Chew</b>
<b>14.10</b>	<b>116</b> Advanced ion-exchange membranes for enhanced performance in membrane capacitive deionization (MCDI) technology <b>Othman Thayfi, Yassine Koumya, Rachid Benhida, Khaoula Khaless</b>	<b>192</b> Front-end and back-end nanofiltration for brine mining <b>Salman Arab, Nikolay Voutchkov, Noura Chehab</b>	<b>100</b> Simulation and modelling of a small-scale barometric desalination unit <b>Sami Own, Adel Nasser, Hector Iacovides</b>	<b>221</b> Environmentally friendly biofouling control in seawater intakes using UVC-LED: a new non-chemical approach <b>Harry Polman, Meno Remmelts, Kaveh Samimi-Namin</b>	<b>171</b> Intake and outfall systems – Middle East experience and lessons learned <b>Hugo Costa, Ian Willoughby</b>	<b>287</b> Desalination of high-salinity organic wastewaters by membrane dialysis <b>Menachem Elimelech</b>
<b>14.30</b>	<b>258</b> Multi-stage optimisation of electro dialysis with bipolar membranes for chemicals production <b>Giovanni Virruso, Andrea Culcasi, Alessandro Tamburini, Andrea Cipollina, Giorgio Micale</b>	<b>141</b> Waste to Value – A pilot demonstration and economic analysis of vaterite calcium carbonate production using brine, CKD, and CO <sub>2</sub> <b>Seungwon Ihm, Abdallatif Abdalrhman, Mohammed Al-Talibi, Omar Al-Raqibah, Eslam Alwaznani, Youngho Lee, Kichul Park, Jinuk Heo, Won Jo, Sehun Kim, Myoung-Jin Kim</b>	<b>122</b> Cost optimization of ultrafiltration and reverse osmosis systems using the Operations Advisor software <b>Guillem Gilabert Oriol, Gerard Massons, Leaelf Hailemariam, Zach Jensen, Joey Liao, Sylvia Insogna</b>	<b>269</b> Trends in RO/NF membrane biofouling control <b>Markus Busch</b>	<b>174</b> Modular GRP intake towers for desalination plants <b>Gregory Gleetus</b>	<b>102</b> Utilization of a pilot-scale electrochemical unit for the treatment of spent caustic and oil-based produced water streams <b>Bassam Tawabini, Abdullah Basaleh, Saleh Al-Aqeel</b>
<b>14.50</b>	<b>40</b> MOFs based membranes for industrial wastewater (IWW) treatment by electro dialysis (ED) technologies <b>Eugenia Pilar Quirós-Díez, Alberto Maimone, Xuefei Yang, David Carvajal, Cristina Martínez</b>	<b>165</b> Green desalination project for resource recovery from brine <b>June-Seok Choi, Linitho Suu, Jonghun Lee, Joowan Lim, Youngkwon Choi, Hojung Rho, Saeromi Lee</b>	<b>212</b> Computational chemistry methods for unveiling high recovery reverse osmosis scaling <b>Victor Yangali Quintanilla, Loren Ramsay, Torben Lund Skovhus, Ditte Andreasen Søborg</b>	<b>68</b> Five ways to prevent biofilm on membranes <b>Fernando Del Vigo, Nuria Peña, Javier Rodriguez, Daniela Vidal, Mike Sinfield</b>	<b>33</b> Tunnelling solutions for water intakes and brine outlets in desalination plant construction <b>Lutz zur Linde, Gerhard Lang</b>	<b>229</b> Pilot-scale advanced wastewater treatment for direct potable reuse: achieving safe water for the beverage industry <b>Rui M.C. Viegas, David Figueiredo, Elsa Mesquita, Sofia Charrua, Carla Costa, Rita Lourinho, Maria João Rosa</b>

15.10–15.30 Coffee break

	<b>Session 7 INFANTE HALL Green Hydrogen</b>	<b>Session 8 D. MARIA Brine Valorisation II</b>	<b>Session 9 D. LUIS Modelling, Prediction and Machine Learning</b>	<b>Session 10 MIRAGAIA Biofouling Control II</b>	<b>Session 11 S. JOAO Solar Thermal Desalination I</b>	<b>Session 12 PORTO Wastewater Treatment and Water Reuse II</b>
<b>15.30</b>	<b>1</b> Desalination as a strategic enabler for green hydrogen production in Algeria: Opportunities and challenges <i>Nadjib Drouiche</i>	<b>177</b> Integration of Mg(OH) <sub>2</sub> production in a real industrial scale reverse osmosis desalination plant <b>Lorenzo Ventimiglia</b> , <i>Fabrizio Vassallo, Giuseppe Lo Burgio, Antonino Campione, Fabrizio Vicari, Alessandro Tamburini, Giuseppe Battaglia, Andrea Cipollina, Giorgio Micale</i>	<b>263</b> Machine learning frameworks for intelligent decision-making and enhanced desalination efficiency <b>Najat A. Amin</b> , <i>Adnan Qamar, Henry Tanudjaja, Ratul Das, Thomas Altmann, Noredine Ghaffour</i>	<b>105</b> Use of concentration polarization (CP) to predict and control membrane biofouling potential <b>Harvey Winters</b> , <i>Eli Oklejas</i>	<b>133</b> Preliminary design of a novel CSP+ORC desalination system equipped with a ZLD unit based on direct contact evaporation <b>Néstor M. Santana-Hernández</b> , <i>Agustín M. Delgado-Torres</i>	<b>250</b> Bachwash wastewater treatment with advanced ceramic membranes: maximizing water reuse and ZLD solutions <b>Patrick Buchta</b> , <i>Julis Gloeckner</i>
<b>15.50</b>	<b>62</b> Analysis of green hydrogen production using seawater desalination at different locations in Europe <b>Tom Ruiter</b> , <i>Heike Glade</i>	<b>198</b> “Alma de Mar”, a pioneer initiative to extract the real value from brine SWRO plants to table <b>Naiara Hernández Ibáñez</b> , <i>Juan Arévalo, Javier Hernández, Víctor Monsalvo, Frank Rogalla</i>	<b>28</b> Predicting specific flux of ultra-filtration membranes using machine learning methods <b>Izzy Medeiros</b> , <i>James Malley, Irina Zaikina</i>	<b>166</b> Control biofouling through membrane flux balance by inter-stage boosting <b>Haytham Abdelfatah</b> , <i>Eli Oklejas</i>	<b>155</b> Effect of increasing top brine temperature on the performance of a solar powered MED system <b>Patricia Palenzuela</b> , <i>M.A. Antar, Juan Miguel Serrano, Lidia Roca, Guillermo Zaragoza</i>	<b>232</b> Closed-loop reverse osmosis with VUV photolysis for the removal of pharmaceuticals and PFAS from water systems <b>Domenico Santoro</b> , <i>Ehsan Nazloo, Andrew Safulko, Erin Mackey</i>
<b>16.10</b>	<b>183</b> Symbiosis of water electrolysis and membrane distillation <i>Markus Wenzel</i>	<b>236</b> Revolutionizing 3D printing with brine valorization <b>Mohammed Alsindi</b> , <i>Noura Chehab, Salman Arab, Nikolay Voutchkov</i>	<b>61</b> Deep learning models for predicting normalized operational parameters for reverse osmosis membranes <i>Jover Erreyes Piloza, Laura Haya, Cosmin Koch</i>	<b>154</b> Novel insights into biofouling growth on reverse osmosis membranes through in-situ microscopic visualization <b>Noshin Karim</b> , <i>Louise Ratel, Nitish Sarker, Catherine Charcosset, Amy Bilton</i>	<b>140</b> First evaluation of a concentrated solar power and desalination system using a double-stage organic Rankine cycle configuration <i>Néstor M. Santana-Hernández, Agustín M. Delgado-Torres, Lourdes García-Rodríguez</i>	<b>76</b> Creating an alternative sustainable water source - reusing MW-WTP effluent to produce demineralized water for a power station <b>Amir Ziv</b> , <i>Harel Rauch, Miriam Faigon Frisi</i>
<b>16.30</b>	<b>280</b> Seawater desalination circular schemes for green hydrogen production <i>Simona M. Asaro, Giovanni Campisi, Alessandro Tamburini, Andrea Culcasi, Giorgio Micale, Andrea Cipollina</i>	<b>260</b> Online analysis of brines for valorization using a solution cathode glow discharge analyzer <b>Christopher East</b> , <i>Connor Fogal, Anders Palmgren, Anthea Sargeant, Nikolay Voutchkov</i>	<b>176</b> Reference class forecasting as a tool for planning RO desalination mega-projects <i>Mohammed Haroon Siyech</i>	<b>52</b> Sustainable cleaning procedures for fouling removal in reverse osmosis plants <i>Núria Adroer, Alex Pascual-Esco, Jordi Aumatell, Paula Sagué, J. Ignacio Ramos, João Lourenço, Hugo Pereira, Aurélie Biurrarena</i>	<b>20</b> Performance evaluation of a 14-effect distillation system driven by solar heat <b>Behzad Shahzamanian Sichani</b> , <i>Szabolcs Varga, Diego Alarcón-Padilla</i>	<b>164</b> Challenges and opportunities for the use of non conventional water resources for agriculture <i>Patricia Terrero Rodriguez</i>
<b>16.50</b>	<b>264</b> Membrane distillation-proton exchange membrane electrolysis integrated system for hydrogen production <b>Aamer Ali</b> , <i>Wenyu Zhao, Vincenzo Liso, Cejna Anna Quist-Jensen</i>	<b>262</b> Utilizing desalination brine to simultaneously produce high-purity magnesium carbonate and vaterite-type calcium carbonate <b>Abdallatif Abdalrhman</b> , <i>Seungwon Ihm, Eslam Alwaznani, Mohammad Talibi, Myoung-Jin Kim</i>	<b>92</b> The distribution and prediction of liquid column velocity between horizontal tubes <b>Yiming Zhao</b> , <i>Xingsen Mu, Shun Hu, Caixue Yang, Wenxu Qu, Shengqiang Shen, Zhe Tang</i>	<b>148</b> Harnessing inspection technology and AI in order to understand and predict pipeline cleaning frequency of sea water intake pipes <i>Pilar Vera-Rodriguez, Simon Bell, Barry Ritchie, Paul Newbury</i>	<b>120</b> <i>Harnessing membrane distillation for sustainable water supply in concentrated solar power plants</i> <i>Bartolomé Ortega Delgado, Juan Antonio Andrés-Mañas, Patricia Palenzuela, Lourdes García-Rodríguez, Guillermo Zaragoza</i>	<b>253</b> Regeneration of haemodialysis spent dialysate by mixed matrix membranes of cellulose acetate / silica/metal organic framework (MOF) <b>Maria Norberta de Pinho</b> , <i>José Francisco Guerreiro, Miguel Pereira da Silva, Marta Bordonhos, Miguel Minhalma, Moisés Luzia Pinto</i>

**17.10 Poster session with drinks in the Exhibition area**

## POSTERS

- 6 Valorization of research: Perspectives and case studies on membrane application  
*Nadjib Drouiche*
- 10 Techno-economic analysis and optimization of hybrid renewable energy systems for electricity generation and desalination  
**Mahmood Khaja Muhieitheen**, *Qamar Abbas*
- 12 Membrane-based recovery and utilization of HF/HNO rinse water in photovoltaic cell manufacturing for circular economy and green hydrogen  
*Nadjib Drouiche*
- 24 Determining the origin of Faradaic yield values greater than unity during treatment industrial wastewater by electrocoagulation  
*Belkacem Merzouk, Mohammed Hamidou, Mohammed Tiaiba*
- 29 Microwave-synthesized 3D manganese oxide monoliths for efficient lithium extraction from geothermal brine  
*Beatriz Guadalupe Saucedo Delgado, Omar Jair Licea Martínez, Lenka Svecova, Luis Mario González Rodríguez, Jair Fernando Rangel Sequeda, Gloria Lourdes Dimas Rivera, Ladislao Sandoval Rangel, Gerardo Antonio Flores Escamilla, Ricardo Briones Martínez, Carlos Enrique Escárcega González, David De Haro Del Rio*
- 44 Polysulfone support modifications for high-flux nanofiltration: applications in desalination and micropollutant control  
*Elham Saud Alkhulaify, Shehzada M. Sajid Jillani, Khalid Alhooshani*
- 47 Chlorine-resistant membrane phosphate zeolite nanofiltration for sustainable water treatment  
**Mahmoud Barakat**, *Muhammad Sajid Jillani, Elham Alkhulaify, Saheed Ganiyua, Isam Aljundi, Khalid Alhooshani*
- 48 Recovery of interest chemicals and industrial water reuse by means of bipolar electrodialysis  
*Maroš Grošík*
- 53 CFD application for operational analysis of self cleaning filters  
*Mohamed Amine Rabitadeddine*
- 59 Water management on a large LNG project: closing the loops  
**Laure Defrance-Ableson**, *Fabien Giraud*
- 85 Optimizing solar and wind energy for reverse osmosis desalination in water-stressed regions  
**Ahmed Geweda**, *Ahmed Omera, Awad Alquaity*
- 86 Innovative RO membrane for enhanced boron rejection and cost-effective desalination  
*Arwa Alsaggaf, Isam Aljundi*
- 87 Selective recovery of magnesium hydroxide from reverse osmosis reject brine via reactive crystallization  
**Qazi Iqra Shafi**, *Isam Aljundi*
- 90 Pre-treatment of mine water for reverse osmosis by means of manganese dioxide filtration  
**Andrea Kassahun**, *Harald Maedl*
- 93 LIFE ELEKTRA – Circular economy applied to nitrate removal, hydrogen generation and waste recovery in drinking water  
**Javier Sanchis-Carbonell**, *Bernardo Lliso, Jaume Cotolí, Miguel Capilla, Josep Ernest Escrivà, Marta Díaz, María Pedro-Monzonís*
- 95 Synthesis of low-cost, high-performance ceramic membranes for efficient water treatment  
**Zakia El Bouhali**, *Abdelaziz Atter, Rachid Benhida, Khaoula Khaless*
- 101 Commissioning a solar-powered zero liquid discharge desalination pilot: Sol2H2O joint research  
**Frederico Felizardo**, *Pedro Horta, Andrea Cipollina, Nunzio Cancilla, Guillermo Zaragoza, Isabel Requena, Juan Antonio de la Fuente, Ángel Rivero Falcón*
- 126 Research on horizontal tube condensation flow and heat transfer in MED systems  
**Minle Bao**, *Luyuan Gong, Qinggang Qiu, Shengqiang Shen, Yali Guo*
- 146 Comparison of minimal and zero liquid discharge systems using multi-criteria analysis  
**Hiba Chebli**, *Philip A. Davies, Nicola Bellantuono, Francesco Fornarelli*
- 147 Optimizing brine management through solar membrane distillation and thermal energy storage: a techno-economic analysis  
*Alejandro Bueso Sánchez, Cristobal Valverde López, Juan Diego Gil Vergel, Guillermo Zaragoza*
- 162 Raising awareness of air-related issues in seawater pipelines: a practical review  
*Mario Valente*
- 215 Contribution to improving the performance of pretreatment in seawater desalination: Case of BWC  
*Hassiba Ben Ottmane, Mourad Berrabah*
- 220 Improvement of ultrafiltration by module integrated 3D printed turbulence promoters  
**Szabolcs Kertész**, *Aws N. Al-Tayawi, Hadid Sukmana, Cecilia Hodúr, Imre Ábrahám, Nóra Garabné Ábrahám, Andrea Süveges-Gruber, Zsuzsanna László*
- 227 Protein-incorporated filtration membrane for urea removal in portable peritoneal dialysis applications  
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- 228 Biomimetic membranes with gramicidin A for separation of mono- and divalent ions  
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- 231 Spatio-temporal analysis of water samples from 18 stations in Kota, Rajasthan, India for 2022-23: based on CCME guidelines  
*Himanchal Bhardwaj, Deeptha Giridharan, Sunil Duhan, Anugya Shukla, Aswathy Puthukkulam, Deepika Bhattu, Venkata Ravibabu Mandla, Anand Plappally*
- 243 ZIF-8 and A-ZIF-8 for efficient p-Cresol adsorption  
**Musawira Iftikhar**, *Imran Ullah Khan, Mohd Hafiz Dzarfan Othman*
- 267 Novel technology for lithium extraction from seawater using carbon-based nanoporous membranes  
**Sergio Sanchez**, *Miguel Duarte, Adélio Mendes*
- 281 Energy recovery from waste(water) streams in the chemical industry by anaerobic treatment and adapted pre-/post-treatment  
**Yuliya Schiesser**, *Meenakshi Prasad, Li Chen, Christoph Blöcher*

**Tuesday morning 29 April 2025**

	<b>Session 13 INFANTE HALL Membrane Distillation I</b>	<b>Session 14 D. MARIA Brine Valorisation III</b>	<b>Session 15 D. LUIS Seawater Reverse Osmosis Desalination</b>	<b>Session 16 MIRAGAIA Renewable Energy Desalina- tion I</b>	<b>Session 17 S. JOAO Solar Thermal Desalination II</b>	<b>Session 18 PORTO Wastewater Treatment and Water Reuse III</b>
<b>8.30</b>	<b>110</b> Liquid gap membrane distillation: optimal use of residual heat <b>Paul Buijs, Radjesh Nidhansing, Tijmen van Heukelingen</b>	<b>77</b> Recovery of lithium from brines by flow electrode capacitive deionisation <b>Hafiz Saif, João Crespo, Sylwin Pawlowski</b>	<b>43</b> Optimizing SWRO: single vs. new innovative multiple stages designs <b>Francisco Jimenez-Castellanos, Georg Herborg</b>	<b>58</b> Wave to energy and water <b>Emiel Schut, Michael Henriksen</b>	<b>3</b> PRE-1900 solar distillation in present-day Namibia <b>Jim Birkett, Emilio Gabrielli</b>	<b>265</b> Identification and quantification of contaminants of emerging concern and microplastics in different aquatic compartments <b>Maria Augusta Dionísio de Sousa, Romeu Ventura Martinho de Avó, Maria Adelaide Ferreira da Silva Rocha</b>
<b>8.50</b>	<b>268</b> Membrane distillation for the treatment of industrial wastewaters <b>Aamer Ali, Hussein Fairousha Sulaiman, Cejna Anna Quist-Jensen</b>	<b>142</b> Selective recovery of lithium from geothermal brines by means of a membrane-based electrochemical system <b>Clara Roggerone, Asnakech Lass-Seyoum, Fabio La Mantia, Julia Kowal</b>	<b>205</b> Kick back with multi-stage SWRO systems, less hassles and more output – a membrane manufacturer’s experience <b>Alvaro Lagartos, Jose Luis Nuno</b>	<b>78</b> Desalination plant fed with 100% renewable energy and process optimization for compactness: case study of Amaala <b>Ruth Mota, Rémy Caball</b>	<b>130</b> Evaluating combined cooling technologies for inland solar MED systems <b>Juan Miguel Serrano, Patricia Palenzuela, Bartolomé Ortega-Delgado, Lidia Roca</b>	<b>251</b> Smart monitoring of contaminants of emerging concern in wastewater treatment <b>Rui M.C. Viegas, Catarina Silva, Célia M. Manaia, Gabriela Faria, Cláudio Costa, Maria João Rosa</b>
<b>9.10</b>	<b>219</b> Novel 4-channel membrane distillation spiral wound module with heat integration <b>Bart Nelemans, Kirtiraj Chavan</b>	<b>168</b> Sustainable production of lithium compounds: a key element towards the energetic transition <b>Ana Beatriz Teixeira, Lício Ferreira, Sylwin Pawlowski, Marisa Rodrigues</b>	<b>26</b> Optimization of seawater reverse osmosis: innovations in pretreatment systems <b>Ratul Das, Thomas Altmann, Yasmeen Nadreen, Graciela Gonzalez Gil, Johannes Vrouwenvelder</b>	<b>114</b> Development of reverse osmosis technology and opportunities for renewable energy integration in the Greek islands <b>Eftihia Tzen, E. Rikos, I. Karga, P. Papadopoulos, N. Stefanatos, D. Theofiloyiannakos</b>	<b>128</b> Solar-driven evaporation system for high-salinity wastewater desalination using 3D chitosan-based interfacial evaporators <b>Hyeong Woo Lim, Sang Joon Lee</b>	<b>109</b> Advanced integrated water treatment system for ultra-pure water production in refineries <b>Irina Zaslavski, Amit Rainer</b>
<b>9.30</b>	<b>57</b> Air-cooled dehumidifier for efficient water desalination using membrane distillation <b>Atia Khalifa, Mohamed Kotb, Suhaib Alawad</b>	<b>190</b> Lithium recovery from LIB wastewater using monovalent selective capacitive deionization and bipolar membrane electrodialysis <b>Minji Je, Seoyeon Lee, Yongjun Choi, Jae-Wuk Koo, Sangho Lee</b>	<b>22</b> Low-energy SWRO and ultra-high recovery inland desalination with true batch processes: Singapore and Texas pilot demonstrations <b>Quantum Wei, Christine Kleffner, Jenny Smythe</b>	<b>7</b> Techno-economic analysis of solar and wind powered desalination to meet the water needs of hundred homes in Karachi, Pakistan <b>Qamar Abbas, Hafiz Muhammad Ali</b>	<b>65</b> Pilot scale solar-assisted adsorption desalination and cooling system: Thermodynamic analysis and performance evaluation <b>Alberto Tiraferri, Ali Naeimi Tabasian, Alberto Saija, Matteo Morciano, Matteo Fasano, Eliodoro Chiavazzo</b>	<b>199</b> Membranes for water reclamation in industrial application: a feasible and proven opportunity <b>Naiara Hernández Ibáñez, Juan Arévalo Vilches, Antonio Giménez Lorang, Irene Fernández Fernández, Marc Sauchelli, Víctor Monsalvo, Frank Rogalla</b>
<b>9.50</b>	<b>187</b> Towards sustainable desalination: weighing environmental and economic outcomes of a hybrid CSP/PV membrane distillation system <b>Varinia Felix, Jeb Shingler, Reema Shinh, Kerri Hickenbottom</b>	<b>252</b> Brine concentration – design and operation of two ultra-high-pressure RO plants with over 10 years of operation <b>Ralf Krüger, Jürgen Müller</b>	<b>69</b> Sustainable approach towards SWRO pre-treatment <b>Carmen Carbonell, Caroline Barbé</b>	<b>9</b> String-driven rectifier for power take-off systems for harvesting energy from oscillatory forces <b>Mahmood Khaja Muhieitheen, Mohammed Khair Al-Solihat</b>	<b>188</b> Impact of fouling on the performance of solar-driven multi-effect desalination systems <b>Jawaher Hajaji, Patricia Palenzuela, Mohamed Abdelkarim Antar</b>	<b>230</b> Fighting water scarcity through the urban reuse of wastewater – Porto case study <b>Mónica Read, Cecilia Santos, Ruben Fernandes</b>

**10.10–10.30 Coffee break**

**10.30–11.50 Panel session “Water Value Chain for Green Hydrogen Production”**

Moderator: *Abraham Negaresh* CPEng, Associate Director – Desalination and Reuse Lead WRc

10.30 Welcome and introductions, *Dr. Abraham Negaresh*

10.35 Green Hydrogen 2.0: Turning hype and sea water desalination synergies into reality, *Lionel Rabin, Haliqa*

10.50 Water treatment solutions for sustainable green hydrogen production, *Dr. Abraham Negaresh*

11.00 Integrating desalination into green hydrogen production: challenges and opportunities offshore and onshore, *Dr. Heike Glade*, Head of Research Group, University of Bremen

11.15 Green hydrogen production in water-scarce regions – a necessity or utter catastrophe? *Dr. Daniel Frank*, Project Advisor, DECHEMA

11.30 Panel discussion

	<b>Session 19 INFANTE HALL Membrane Distillation II</b>	<b>Session 20 D. MARIA Brine Valorisation IV</b>	<b>Session 21 D. LUIS Enhancing Desalination Performance</b>	<b>Session 22 MIRAGAIA Renewable Energy Desalina- tion II</b>	<b>Session 23 S. JOAO Solar Desalination</b>	<b>Session 24 PORTO Salinity Gradient Energy</b>
<b>11.50</b>	<b>96</b> A model for batch operation in vacuum-assisted air gap membrane distillation <i>Isabel Requena, Juan Antonio Andrés-Mañas, Guillermo Zaragoza</i>	<b>150</b> Integrated production of Mg(OH) <sub>2</sub> powders and high valuable salts from seawater desalination brines through evaporative ponds <i>Giuseppe Battaglia, Lorenzo Ventimiglia, Fabrizio Vicari, Alessandro Tamburini, Andrea Cipollina, Giorgio Micale</i>	<b>181</b> Retrofitting assessment of reverse osmosis desalination plants based on energy diagnosis <i>Juan I. Pinaglia-Villalón, María Gutiérrez-Valcarce, Rolando Bosleman, Lourdes García-Rodríguez</i>	<b>189</b> The 100% RES Islands Initiative - the Energy Water nexus <i>Gianni Chianetta</i>	<b>191</b> Optimization of a hybrid PV/T-driven desalination system for sustainable freshwater production <i>Ahmed Abdelhalim, Shehab Mansour, Omar Khalil</i>	<b>88</b> 3D printing of profiled cation-exchange membranes for harvesting salinity gradient energy from membrane distillation brines <i>Mekhna Venu, Cláudia Galinha, João Crespo, Sylwin Pawlowski</i>
<b>12.10</b>	<b>91</b> Enhancing productivity and energy efficiency in vacuum assisted air gap multistage membrane desalination <i>Ahmed Omera, Mohammed Antar</i>	<b>123</b> Concentrating high-salinity brines using low salt rejection reverse osmosis membranes <i>Guillem Gilabert Oriol, David Arias, Claudia Niewersch, Tirtha Chatterjee, Brittany Fisher, Caleb Funk, Harith Alomar</i>	<b>71</b> Using satellite data to improve seawater characterization and optimize plant designs <i>Rémy Caball, Olivier Raillard, Sébastien Smet, Delia Pastorelli</i>	<b>277</b> Desalination using renewable energy integrating solar energy into SWPC’s projects <i>Faisal Alhelal</i>	<b>216</b> Dynamic control of the back-pressure in a photovoltaic-powered desalination system for enhanced system performance <i>Emmanuel Ogunniyi, Bryce S. Richards</i>	<b>163</b> Blue energy: renewable energy production from desalination brine <i>Patricia Terrero Rodriguez</i>
<b>12.30</b>	<b>55</b> Sustainable solutions to concentrate management: a novel solar-driven membrane crystallizer for zero-liquid discharge <i>Kerri Hickenbottom, Jeb Shingler, Minna Allouzi, Varinia Felix, Shelbi Jenkins, Wei Pan, Robert Norwood</i>	<b>202</b> Brine valorization system with internal reuse of brine minerals <i>Christopher East, Noura Chehab, Ahmed Al-Amoudi, Nikolay Voutchkov</i>	<b>84</b> Optimization of forward osmosis (FO) modules arrangement for high-efficiency feed concentration in single-pass operation <i>Rajashree Yalamanchili, Pere Olives Cegarra, Albert Galizia, Gaëtan Blandin</i>	<b>208</b> Dakhla desalination plant using renewable energy <i>Lahcen Hasnaoui, Mohamed Ouhssain</i>	<b>145</b> Optimization of time-variant, solar-powered electro dialysis desalination architectures <i>Melissa Brei, Jimmy Tran, Amos Winter</i>	<b>178</b> Assessment of the performance of a pilot scale reverse electro dialysis stack equipped with segmented electrodes <i>Francesco Volpe, Emanuela Mangiaracina, Giuseppe Battaglia, Andrea Cipollina, Giorgio Micale, Alessandro Tamburini</i>
<b>12.50</b>	<b>271</b> VMEMD and related separation processes from lab-scale to industrial size by module technology of EvCon <i>Markus Wenzel</i>	<b>259</b> Exploring the circularity of brine valorisation through neural network modelling of an electro dialysis with bipolar membranes pilot <i>Giovanni Virruso, Andrea Cipollina, Alessandro Tamburini, Giorgio Micale</i>	<b>37</b> The influence of water permeability, solute resistance and mass transfer coefficient on water flux behavior in forward osmosis <i>Abdulrahman Alalawi, Ibrahim Al-Mutaz, Nawaf Bin Darwish</i>			<b>274</b> Novel thin-film nanocomposite (TFN) membranes by incorporation of halloysite nanoclay for pressure retarded osmosis applications <i>Akif Nihal, Syed Javaid Zaidi</i>

**13.10–14.10 Lunch**

## Tuesday afternoon 29 April 2025

	<b>Session 25 INFANTE HALL</b> <b>Membrane Distillation / Thermal Desalination</b>	<b>Session 26 D. MARIA</b> <b>Membranes for Water Treatment I</b>	<b>Session 27 D. LUIS</b> <b>Fouling Control</b>	<b>Session 28 MIRAGAIA</b> <b>Novel Processes and Applications</b>	<b>Session 29 S. JOAO</b> <b>Remineralisation</b>	<b>Session 30 XPRIZE session</b> <b>PORTO</b>
<b>14.10</b>	<b>172</b> Sustainable membrane distillation desalination for hydrogen production <i>Alba Ruiz-Aguirre, Alejandro Bueso, Antonio Atienza-Márquez, Guillermo Zaragoza</i>	<b>245</b> Functionalized Li <sup>+</sup> /H <sup>+</sup> separation membranes for pH sensing <i>João Teixeira, Ricardo Campos, Magda Barros, Ana Moreira, Daniela Campanhã, José Gonçalves</i>	<b>115</b> Desalination without chemicals: Bonaire's modular plant and the application of direct osmosis cleaning <i>Iris Sutzkover Gutman, Irina Zaslavski</i>	<b>233</b> "Mar Menor" – a combined technical solution proposal based on desalination techniques and other water treatment methods <i>Rafael Buendía Candel, Domingo Zarzo, Alberto Morales, Elena Campos</i>	<b>237</b> Magnesium remineralization: Impact on microbial water quality of reverse osmosis produced drinking water during distribution <i>Nadia Farhat, Ratna Putri, Alejandra Ibarra Felix, Johannes Vrouwenvelder</i>	<b>XPRIZE water scarcity: a call for revolutionizing desalination</b> <i>Hossein Atoufi</i>  <i>Join us for an engaging 2-hour session on the \$119M XPRIZE Water Scarcity competition. We'll spotlight Track B - Desalination: Novel Materials and Methods, which seeks groundbreaking approaches to cost-effective, sustainable seawater desalination. Learn how to participate as a competitor, hear from industry experts, connect with teams developing cutting-edge solutions, and explore the future of water innovation. All are welcome!</i>
<b>14.30</b>	<b>45</b> Exploring the effects of feed and permeate temperatures on fouling and wetting of PTFE membranes within membrane distillation <i>Atefeh Tizchang, Itzel Alcaraz Bernades, Wolfgang Gernjak, Morgan Abily</i>	<b>234</b> Going forward with RO for PFAS removal: experience with TFN RO membranes from lab to pilot and to a full-scale plant <i>Eugene Rozenbaum, Young Ju Lee, Wansuk Choi, Jung Soo Kim, Roy Daly</i>	<b>203</b> Identifying membrane foulants and the role diagnosis plays in optimized performance to reduce chemicals and maximize membrane life <i>Doug Eisberg, Ken Robinson, Stuart Leak</i>	<b>81</b> Eutectic solvent (ES)-based flow electrodes for water desalination <i>Elena Gabirondo, Hafiz Saif, Vitor Alves, João Crespo, Liliana Tomé, Sylwin Pawlowski</i>	<b>266</b> Engineered carbonates for enhanced remineralization processes <i>Vega Bierwolf, Heidrun Vedder, Victor Wasmuth, Assiyeh Tabatabai, Christopher Pust</i>	
<b>14.50</b>	<b>136</b> Thermal driven ultrapure water production for water electrolysis with membrane distillation <i>Rebecca Schwantes, Yair Morales, Eric Pomp, Jan Singer, Kirtiraj Chavan, Florencia Saravia</i>	<b>144</b> Membrane cascades for enhanced rejection of organic pollutants in RO of brackish and sea water <i>Fatima Zohra Charik, Saad Alami Younssi, Murielle Rabiller-Baudry</i>	<b>179</b> A novel numerical modelling tool for the study of colloidal fouling in electrodialysis units <i>Francesco Volpe, Giuseppe Battaglia, Andrea Cipollina, Giorgio Domenico Maria Micale, Alessandro Tamburini</i>	<b>256</b> Innovative marine work on the first desalination plant in Portugal <i>Ana Fernandez, Jose Maria Colubi</i>	<b>54</b> Production of remineralization chemicals from RO brines: Pilot platform development <i>Antonino Campione, Giuseppe Lo Burgio, Fabrizio Vicari, Alessandro Tamburini, Lorenzo Ventimiglia, Fabrizio Vassallo, Giuseppe Battaglia, Andrea Cipollina, Giorgio Micale</i>	
<b>15.10</b>	<b>97</b> Thermal parameters distribution and heat transfer deterioration in a horizontal tube falling film evaporator <i>Chao Li, Dayuan Yuan, Liuyang Zhang, Qiang Meng, Shengqiang Shen</i>	<b>27</b> Valorizing EC-sludge for MF kaolinite membrane fabrication: a sustainable approach for seawater pretreatment for RO desalination <i>Abdessamad Belgada, Raowia Lamhar, Fatima Zohra Charik, Ibrahim Ounouss, Adil Dani, Saad Alami Younssi</i>	<b>16</b> The selection of nanofiltration membrane characteristics to purify landfill leachate and reduce concentrate <i>Alexei Pervov, Viacheslav Dzyubenko</i>	<b>255</b> Innovative monitoring solutions for reverse osmosis plants by Pyxis Lab® <i>Diana Cruz, Dario Alonso</i>	<b>56</b> A pilot plant scale circular approach for the CO <sub>2</sub> extraction from RO brines <i>Giuseppe Lo Burgio, Antonino Campione, Fabrizio Vicari, Alessandro Tamburini, Lorenzo Ventimiglia, Fabrizio Vassallo, Giuseppe Battaglia, Andrea Cipollina, Giorgio Micale</i>	
<b>15.30</b>	<b>129</b> Electrothermal-based hanging type evaporator for effective seawater desalination <i>Younghoon Suh, Sangjoon Lee</i>	<b>38</b> Unidirectional porous membrane prepared by combined crystallization and diffusion method for desalination <i>M. Asipi Qostolani, Mohammed Abdul Azeem, Turki Nabieh Baroud</i>	<b>210</b> Optimizing coagulation dose, pH and rapid mixing with MFI-UF to reduce particulate/colloidal fouling in RO/NF <i>Yiman Liu, Abrar Adema, Afrasiab Yameen, Nirajan Dhakal, Peter Vollaard, Rinnert Schurer, Begüm Tanis, Jan Schippers, Maria Kennedy</i>	<b>283</b> Eco-friendly deep-sea desalination combining reverse osmosis and oil and gas solutions <i>Antoine Vuillermet</i>	<b>21</b> Dual benefits of immobilized carbonic anhydrase: Enhancing water quality and reducing carbon footprint in desalination processes <i>Veerle Vandeginste, Philippe Tob, Jacob Rubel, Dharmjeet Madhav</i>	
<b>15.50</b>	<b>107</b> Analysis of crystallization fouling growth and heat transfer on horizontal tube surfaces under constant heat flux <i>Boyu Wang, Shengqiang Shen, Xingsen Mu</i>	<b>196</b> Lowering OPEX and feed pressure requirements for municipal water production and reuse using Aquaporin Inside BWRO <i>Jan Benecke, Xuan Tung Nguyen, Xin Hui Lim, Wanting Wang, Weng Hong Ho, Guofei Sun, Khung Hanh Le, Joerg Vogel, Liyun Tai, Na Peng, Victor Monsalvo Garcia, Juan Arévalo Vilches</i>		<b>293</b> Clean water for the future – Plastics solutions for the entire value chain <i>Daniel Fechtig</i>		

**16.10 Coffee break**



	<b>Session 31 INFANTE HALL Membrane Distillation (Membranes)</b>	<b>Session 32 D. MARIA Membranes for Water Treatment II</b>	<b>Session 33 D. LUIS Pretreatment</b>	<b>Session 34 MIRAGAIA Energy Efficiency and Performance Enhancement</b>	<b>Session 35 S. JOAO Environmental Impacts of Desalination</b>
<b>16.30</b>	<b>257</b> Development of PVDF distillation membranes for brine treatment using triethyl phosphate as green solvent <i>Matilde Traverso, Marcello Pagliero, Camilla Costa, Ilaria Rizzardi, Antonio Comite</i>	<b>98</b> Testing polymeric membrane resistance to ozone to extend membrane lifetime or promote their recycling <i>Bianca Zappulla Sabio, Gaetan Blandin, Wolfgang Gernjak, Lide Jaurrieta</i>	<b>70</b> Decoupling dual-media filter into combined flotation step and high velocity sand monolayer: Results from demo plant <i>Rémy Caball, Caroline Barbé, Delia Pastorelli</i>	<b>99</b> Optimising energy efficiency of seawater desalination plants with high-recovery by coupling OARO and RO processes <i>Jesús Montes-Sánchez, David Sánchez, Lourdes García-Rodríguez</i>	<b>104</b> Steps for optimizing energy and water consumption in the operation of reverse osmosis systems with a focus on chemical treatment <i>Dan Freeman, Liana Kunzler, Rodrigo Cadihna, Marck Solla, Leonardo Kuhn, Fiona Finlayson, Raul Gonzalez</i>
<b>16.50</b>	<b>41</b> Biomass-derived carbon and carbon nanofibers integrated electrospun Janus membranes: a new frontier in membrane distillation <i>Md. Emdad Hossain, Turki N. Baroud, Md. Abdul Aziz</i>	<b>201</b> Enhanced CO <sub>2</sub> /CH <sub>4</sub> separation using amine-modified ZIF-8 mixed matrix membranes <i>Imran Ullah Khan, Mohd Hafiz Dzarfan Othman, Mukhlis A. Raman, Musawira Iftikhar</i>	<b>72</b> Enhancing water production capacity: the role of filtration velocity in multi-media filters for desalination <i>Ofir Yamin</i>	<b>46</b> Maximize energy efficiency: parallel axial piston pumps and active energy recovery devices <i>Francisco Jimenez-Castellanos</i>	<b>127</b> Antiscalants in seawater desalination: impacts on microbial growth and environmental fate <i>Graciela Gonzalez Gil, Marian Castrillon Tobon, Camila Albarracin Ruiz, Johannes Vrouwenvelder</i>
<b>17.10</b>	<b>173</b> Hydrophobic PVDF flat sheet membrane modified using hybrid structure nanomaterial of (TiO <sub>2</sub> /GO) for air gap membrane distillation <i>Hamad Alromaih, Patricia Gorgojo, Krishnaprasad Manoj, Maria Perez-Page</i>	<b>244</b> Evaluation of reverse osmosis membrane performance for the treatment of oil sands process-affected water (OSPW) <i>Seoyeon Lee, Sanghlee Lee, Song Lee, Yusik Kim, Hyeongrak Cho, Yongjun Choi</i>	<b>143</b> Optimizing pretreatment for reverse osmosis desalination through simultaneous media filter monitoring <i>Yasmeen Nadreen, Graciela Gonzalez-Gil, Johannes Vrouwenvelder, Ratul Das, Thomas Altmann</i>	<b>288</b> Sorek 2 - Be'er Miriam Desalination Plant: Leading the way in sustainable desalination <i>Dotan Gur, Gregory Shtelman, Irina Zaslavski, Naaman Cohen</i>	<b>217</b> Desalination brine matters: Impacts of antiscalants on seagrass and its corresponding bacterial epiphytes <i>Ryan Sirota, Gidon Winters, Gilad Antler, Eyal Rahav, Edo Bar-Zeev</i>
<b>17.30</b>	<b>175</b> Advancing circular desalination: photothermal membranes to overcome membrane distillation limits for brine valorization <i>Sergio Santoro, Roviell Berhane Zegeye, Tsothe Dadiani, Efrem Curcio, Marco Aquino, Antonio Politano</i>	<b>209</b> Addressing water scarcity in the Canary Islands: SWRO membranes with TFN technology as a proven solution for irrigation <i>Beatriz Calderon, Alvaro Lagartos, Silvia Gallego</i>	<b>226</b> Optimization of membrane filtration processes using the design of experiments in different whey solutions <i>Hadid Sukmana, József Csanádi, Cecilia Hodúr, Zsuzsanna László, Gábor Veréb, Sándor Beszédes, Imre Ábrahám, Nóra Garabné Ábrahám, Andrea Süveges-Gruber, Szabolcs Kertész</i>	<b>224</b> Energy recovery device retrofit of an existing BWRO plant in Spain <i>Rolando Bosleman, Juan Cifuentes</i>	<b>193</b> Carbon footprint of desalination and mitigation strategies <i>Salman Arab, Nikolay Voutchkov, Noura Chehab</i>
<b>17.50</b>			<b>278</b> Current situation of physical pretreatment systems used in seawater reverse osmosis desalination plants in the Canary Islands <i>Sigrid Arenas Urrea, Baltasar Peñate Suarez, Noemi Melián Martel</i>		

**19.30–23.00 Gala Evening at the Casa Ferreirinha, Porto. Pick up outside Alfândega Congress Hall at 19.00**

	<b>Session 36 INFANTE HALL</b> <b>Drinking Water/Operational Efficiency/Water Treatment Market</b>	<b>Session 37 D. MARIA</b> <b>Innovations in Reverse Osmosis</b>	<b>Session 38 D. LUIS</b> <b>Modelling, Prediction and Optimisation</b>	<b>Session 39 PORTO</b> <b>Energy Recovery Systems</b>
<b>8.30</b>	<b>138</b> Mg <sup>2+</sup> and Ca <sup>2+</sup> enrichment to drinking water originated from the water source (seawater, ground water) without extra chemicals <i>Elad Barak</i>	<b>60</b> Enhanced energy efficiency strategies in desalination technologies <i>Guillem Gilibert Oriol, Harith Alomar, Maria Perez Macia, Santhosh Ramalingan, Mahesh Kulkarni</i>	<b>106</b> Three-dimensional model of ion transport in composite membranes: effect of the internal structure and equivalent thickness <i>Fernan David Martinez Jimenez, Bastiaan Blankert, Cristian Picioreanu</i>	<b>223</b> Europe leading the way to reduce energy use in water reuse and brackish desalination projects: a tale of two plants <i>Angel Abajas, Rolando Bosleman, Erik Desormeaux</i>
<b>8.50</b>	<b>82</b> Dolomite for magnesium supplementation of desalinated drinking water in Saudi Arabia <i>Christopher Fellows, Ali Alhamzha</i>	<b>111</b> A new approach to reverse osmosis pressure vessel design <i>Mike Sinfield, David Jiménez, Amit Sankhe, Daniela Vidal, Paul Choules</i>	<b>30</b> Modeling of mass transfer dynamics in spacer-filled channels in membrane processes using direct numerical simulations <i>Santiago Cespedes, Bastiaan Blankert, Cristian Picioreanu</i>	<b>79</b> Optimization and design of energy recovery systems <i>Hussain Basamh, Muhammad Ridwan, Thomas Altmann, Ratul Das</i>
<b>9.10</b>	<b>63</b> Evaluation of the operational efficiency and performance of a combined desalination and salt (NaCl) production plant in Indonesia <i>Ersan Ozdemir, Pablo Canada Garcia, Nélio Moreira</i>	<b>151</b> Membrane deformation in reverse osmosis: In-situ quantification and impacts on pressure drop in permeate channel <i>Luigi Ranieri, Luca Fortunato, Johannes Vrouwenvelder, Cristian Picioreanu, Bastiaan Blankert</i>	<b>167</b> Multiscale modeling of ion transport in IEMs and polyamides: bridging microscale and macroscale insights <i>Nasser Al-Hamdani, Giorgio Purpura, Giorgio De Luca, Giuseppe Costanzo, Javier Luque Di Salvo, Andrea Cipollina, Giorgio Micale</i>	<b>35</b> On-site demonstration of a robust rotary energy recovery device <i>Francesco Giuseppe Ladisa, Victor Ruiz, Juan De Salas</i>
<b>9.30</b>	<b>249</b> Reducing non-revenue water: the first step toward addressing water scarcity and enhancing efficiency <i>Flávio Oliveira, Sara Cunha</i>	<b>206</b> OPEX optimization in RO systems for challenging water: a new revolutionary 36 mil membrane feed spacer design <i>Alvaro Lagartos</i>	<b>149</b> Numerical assessment of membrane intrusion in permeate channels of reverse osmosis units <i>Giuseppe Battaglia, Andrea Sireci, Luigi Ranieri, Bastiaan Blankert, Giorgio Micale, Cristian Picioreanu</i>	<b>273</b> Maximizing water production with minimal footprint for containerized systems <i>Eli Oklejas</i>
<b>9.50</b>	<b>285</b> Transforming the water treatment market <i>Daniele Strongone</i>	<b>157</b> Waterfountain: Sub-sea desalination with easy maintenance <i>Paul Buijs, Kyle Hopkins, Rolf Bendiksen, Per Olsen</i>	<b>103</b> Accurate bench scale measurement of mass transfer in RO <i>Bastiaan Blankert, Santiago Cespedes, Ratul Das, Thomas Altmann, Johannes Vrouwenvelder, Cristian Picioreanu</i>	<b>225</b> PX Q400 impact in demonstration plant achieving less than 2 kWh/m <sup>3</sup> in energy consumption <i>Rolando Bosleman, Juan Cifuentes</i>

10.10–10.30 Coffee break

10.30–10.40 XPRIZE

10.40–11.40 Miriam Balaban Innovation Award Session sponsored by ACWA Power

**Moderator:** Sharzima Imtiaz Mukhri, Senior Manager - Innovation initiative, ACWA Power

10.40 Qianhong She. Semi-closed reverse osmosis (SCRO) for low-energy, low-fouling, and highly adaptive seawater desalination.

Nanyang Technical University, Singapore.

10.45 Lucie Ries. Pressure Free Reverse Osmosis solution. Ilion Water Technology, France.

10.50 Erik Hoek. Ultra-high pressure (and temperature) compaction resistant reverse osmosis membrane. UCLA, USA.

10.55 Arian Edalat. Smart electro-active anti-scaling/anti-fouling desalination membrane. Active Membranes, Inc. USA

11.00 David Jimenez. Mega Vessel Piedmont Pacific. Spain

11.05 Sander ten Cate. Biodegradable water treatment. Termanox B.V, The Netherlands

11.10 Questions & Answers



	<b>Session 40 INFANTE HALL Ultrafiltration</b>	<b>Session 41 D. MARIA Regional/Case Studies</b>	<b>Session 42 D. LUIS Novel Technologies</b>	<b>Session 43 PORTO Zero Liquid Discharge</b>
<b>11.40</b>	<b>124</b> Robust ultrafiltration-based pretreatment to secure long term sustainable operation <i>Guillem Gilabert Oriol, Blanca Salgado, Gerard Massons, Harith Alomar, <b>Oliver Neumann</b>, Jan Radel</i>	<b>67</b> Desalination in Algeria: a lifeline against water scarcity <i><b>Nadjib Drouiche</b>, Ahmed Kettab</i>	<b>270</b> Natural adsorbents for sustainable recovery of key components from mining wastewater and seawater: preliminary experimental result <i>Hugo Sánchez-Moreno, <b>Lourdes García-Rodríguez</b>, Celso Recalde-Moreno, Abel Riaza-Frutos</i>	<b>73</b> Evaluating the impact of closed-loop RO systems on ZLD in textile industry: case study from Tirupur, India <i><b>Vinay Narayan Hegde</b>, Joachim Went, Joachim Koschikowski, Harald Schönberger, Werner Platzer</i>
<b>12.00</b>	<b>118</b> Assessment of an ultrafiltration module with an integrated pre-filter as seawater desalination pre-treatment <i>Daniel García-Huertas, Michael Hoffmann, Christian Staaks, Jan Rädels, Harith Alomar, Guillem Gilabert-Oriol, Martin Heijnen, <b>Olga Ferrer Mallén</b>, Jorge J. Malfeito</i>	<b>39</b> Desalination for decarbonized fertilizer production: a comparative analysis of seawaters in the MENA region using MLD strategies <i><b>Nikhil Dilip Pawar</b>, Thomas Pregger, Patrick Jochem</i>	<b>282</b> Semi-closed reverse osmosis (SCRO) for low-energy, high-resilience desalination <i>Qianhong She</i>	<b>241</b> Near zero liquid discharge with seeded membrane distillation crystallization <i><b>Stefanie Flatscher</b>, Mark Hlawitschka</i>
<b>12.20</b>	<b>218</b> Synergistic effects of 3D-printed spacers and modular vibration towards membrane fouling mitigation <i><b>Aws Al-Tayawi</b>, Imre Vajk Fazekas, Szabolcs Kertész</i>	<b>286</b> Sustainable water management: innovations in alternative water sources — Case studies <i>Ajay Popat</i>	<b>276</b> Towards net zero through the PPP route <i>Nabil Aljohani</i>	<b>66</b> Development of a membrane-based zero liquid discharge treatment train for a bio-chemical industry <i>Sara Salvador Cob</i>
<b>12.40</b>			<b>169</b> Selection of pre-RO cartridge filters <i>Oren Heymans</i>	<b>180</b> Optimised preliminary design of seawater desalination with zero liquid discharge driven by solar micro-gas turbines <i><b>Rafael González-Almenara</b>, Agustín Delgado-Torres, Jesús Montes-Sánchez, Néstor Santana-Hernández, David Sánchez, Lourdes García-Rodríguez</i>

**13.00–14.00 Lunch**

**14.00 Closing**

**Miriam Balaban Innovation Award will be announced.**

**14.00–18.00 Sol2H2O Water-Energy Transition Symposium: Portuguese National Day. In Portuguese only.**