<table>
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</table>
| 08.45 | Global Closing Dumpsites Initiative Report: What will be the Price Everyone Pays for Unmanaged Dumpsites?  
This session will showcase the danger of "doing nothing" scenario of operating unmanaged ditches and its impact to the ecosystems and contribution to marine litter for those waste disposal facilities that are close to the rivers and oceans. It will also highlight what we can do among the WGL members in assisting those ditches wanting to transition to a better and safer sanitary landfill operations. Few case studies of success stories will be presented highlighting contribution to greenhouse gas emission reduction as well as enhancing liveability of the surrounding communities.  
James Law, Chair, Landfill Working Group, ISWA |
| 09.05 | Landfill Mining Technologies and its Financial Sustainability  
This presentation will focus on how landfills and circular economy can go hand in hand; not only can landfills play a vital role as a final sink for materials that can be recycled or incinerated but also how to transition from ditches to sanitary landfills operations and how to use landfill mining as a potential recovery technique for valuable resources and minimize the environmental risks from ditches.  
René Möller Rosendal, Senior Project Manager, AV Miljø and Partner, Danish Waste Solutions, Denmark |
| 09.25 | Global Climate Financing in Potential Dumpsite Closure  
This session will present IFC’s risk-based approach to dumpsite closure and how IFC works with governments to attract programmatic climate finance that offer direct, customized financing to municipalities and private sector without sovereign guarantees. IFC will discuss how to provide a tailored technically sound risk-based approach to close ditches at lowest cost and consistent with IFC’s E&S Performance Standards.  
James D. Michelsen, Sr. Industry Specialists, International Finance Corporation (IFC), USA |

<table>
<thead>
<tr>
<th>Time</th>
<th>TRACK 2: MAKING WASTE MANAGEMENT SEXY AND INTELLIGENT THROUGH TECHNOLOGIES...</th>
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</table>
| 08.45 | What are the Objectives of ISO/TC 297 and How Can Standards Help Improve RCV Safety and Performance?  
The young technical committee ISO/TC 297 has only been working on standards for waste collection and transportation management for a few years. However, regarding waste collection vehicles, multiple standards on the safe use of RCVs, on the comparability of their energy efficiency and on the prevention of odour pollution have already been successfully developed. In the future, subjects such as digitization, autonomous operation or alternative drives will also be addressed in new projects to make waste collection and transportation even more sustainable and user-friendly.  
Frank Diedrich, Director, Elinitmed Municipal Equipment & Chair for ISO/TC 297, Belgium |

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<tr>
<th>TRACK 3: BEING CIRCULAR IS THE NEW TREND, ARE YOU IN OR OUT?</th>
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<tr>
<td>08.45 – 09.45AM // AUDITORIUM @ EXPO HALL</td>
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</table>
| APRU Session: ESG-Guided Plastic Waste Management Towards a Circular Economy  
The heavy use of plastic and consequent generation of plastic waste has led to a dilemma. Plastic cannot be eradicated, and it is essential in daily life. Though it is not possible to completely solve this problem, it is possible to minimize the dependence on single-use plastics as much as possible. Therefore, there is an urgent need to develop sustainable packaging strategies. Flexible packaging, the reduce-reuse-recycle concept, and the utilization of eco-friendly raw materials such as bioplastics are some of the top strategies, leading global industries have already adopted. In a circular economy, plastic waste is the top priority. By incorporating ESG criteria into daily business practices, global industries will be able to achieve a circular economy. Hence, ESG criteria will be the driving force prompting industries to achieve their sustainability goals.  
Prof Yong Sik Ok, Korea University, Republic of Korea: Plastic Management for a Circular Economy: Environmental, Social, and Governance (ESG) and Sustainable Packaging |

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<tr>
<th>Time</th>
<th>Panel Discussion: Harnessing Technology for Waste Collection &amp; Transportation and Harmonizing Practices for Clean Environment</th>
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</table>
| 09.25 | Panel Discussion: Harnessing Technology for Waste Collection & Transportation and Harmonizing Practices for Clean Environment  
Having a robust waste collection and transportation infrastructure and system enable cities to uphold the clean and green urban environment. Companies are leveraging advanced technology to innovate the design of refuse collection vehicles such as optimisation of energy and fuel consumption with the reduction of CO2 emission. On top of conceptualizing the action plan for net-zero emission, companies are also introducing engineering solutions for safe operation of the waste collection vehicles and equipment and for the improvement of efficiency of waste collection and transportation. Standards can be used as a tool to accelerate industry transformation in which companies will demonstrate the application of relevant ISO/TC 297 standards.  
Moderated by:  
Dr. Arne Poulsen, Chair of the Working Group on Recycling and Waste Minimisation & Gunilla Carlsson, ISWA Board Member and Syssel Public Affairs Director |

Panelists:
**09.45 Salient Points of the First Plastic Credit Standards: Plastic Pollution Reduction Standard**

In one of the epicentres of this global pollution crisis, Plastic Credit Exchange (PCX) released the first governing standards for plastic credits in March 2020, which has now evolved into the Plastic Pollution Reduction Standard (PPRS). The plastic credit system was ideated and developed to provide solutions for businesses to work together with communities, institutions, and local governments to stop the flow of plastic into nature. This presentation highlights the key points and guiding principles of the world's first plastic credit standards and how it addresses the questions that this mechanism faces.

Richard de Guzman, Standards and Compliance Manager, Plastic Credit Exchange, Philippines

**10.05 Intermision / Tea Break**

**10.20 When Formality Meets Informality in Waste Collection System: A Case Study from Lima, Peru**

The study presents part of a wider project focused on the urban waste management system (WMS) of a specific district in Lima (Peru). It aims to understand environmental burdens and derived challenges and opportunities related to the formal and informal waste flows. The modelling included household waste generation, waste composition, collection systems, transport to a transfer station, and treatment in a controlled sanitary landfill. The Life Cycle Assessment methodology was applied to the baseline WMS to compute preliminary results. Mainly preliminary data were used, and the EASETECH software assisted the analysis by considering the ReCipe Midpoint approach.

Sara Bottausci, PhD Student, University of Bologna, Italy

**Collecting Organics – SmartBins and Stupid People?**

The presentation will focus on digitalisation applied to MSW collection so apply PAYT charges and change households behaviour towards more separate collection and less production of residual waste. Three practical experiences of digitalisation and IT solution applied to MSW collection in Italy will be presented and discussed. Each scheme led to a change in habits and behaviour of users/waste-producers.

For each experience, the changes that these solutions brought about in the habits and behaviour of users/waste-producers will be presented including data and information showing positive and negative effects on MSW production, recycling and resource recovery and eventual increase of littering.

Marco Ricci, Managing Director, Alterego sas and Vice-Chair, Biological Treatment of Waste Working Group, ISWA

**Current Status and Policy Direction of Circular Economy in South Korea**

In this study, in terms of material resources (product unit), the circular economy policy roadmap framework was established consisting of the following phases - management of the entire cycle of resource circulation, promotion of circular economy implementation, evaluation and monitoring of the implementation status. Using key strategies such as encouraging enterprises to design resource-circulating products, spreading a culture of resource-circulating consumption that the public agrees with, enhancing eco-friendly recycling of resources, creating an innovative circular economy model, and making it a growth engine, and promoting the implementation of a digital information-based circular economy.

Ji Hye Jo, Senior Research Fellow, Korea Environment Institute, South Korea

**10.40 The End of End-of-Pipe Era: Towards Sustainable Solid Waste Management in Indonesia**

The collapse of the Leuwigajah landfill in 2005 became the turning point in the direction of solid waste management policy in Indonesia, which is from using the ‘end-of-pipe’ system, moving forward to 3R (reduce, reuse, and recycle) and circular economy approach. This presentation presents solid waste management development in Indonesia over the last 15 years toward sustainable solid waste. It will be an overview and an analysis of the progress of Indonesia toward sustainable solid waste. It will also propose an approach to planning and shifting waste management policies from the end-of-pipe to the circular economy approach.

Kwok Wai Chong, Deputy Director (Cluster Development Department) Environmental Technology & Industry Development Division, Joint Operations and Technology Group, National Environment Agency, Singapore

**Benefits and Advantages of the Side Loading Municipal Solid Waste Collection System**

Waste collection has become a costly and unrewarding task, with many waste collectors experiencing problems to perform a proper job. With the aim to improve the level of service and ease some of its structural problems, the side loading waste collection system has been adopted by some major cities worldwide. This system comprises a side loader compactor truck and high-capacity side loading containers which can be easily operated, cost-effective, and safe for the waste collectors.

Panellists: Jakob Lambsdorff, CEO, ALBA WH Smart City, Singapore

**09.50 – 10.50AM // AUDITORIUM @ EXPO HALL**

**Country: Indonesia**

1. **Supporting Informal Buyers of Recyclables to Increase Plastics Capture in Banyuwangi, Indonesia**

Prisilla Resolute, Sociologist, Indonesia Solid Waste Association in the Clean Ocean

2. **Producer Responsibility Roadmap: Promoting a Sustainable Business and a Circular Economy in Indonesia Through the Implementation of MoEF Regulation P.75/2019**

Eka Hilda, Young Expert Environmental Impact Control Officer, MoEF Indonesia

**10.50 – 11.20 // Auditorium @ Expo**

**Country: Portugal**

1. **Accounting For Nature Contributions to People in A Sustainability Strategy: The Case of a Waste Management Company in Portugal**

Dr. Jane Gilbert, Malti Gadgil, Dr. Henning Friege, Kartik Kapoor, Francesca Caliesi

2. **Zero Waste for Businesses, Case Studies, and the Impact on Waste Collectors**

Hani Tohme, Senior Partner, Head of Sustainability MENA & Head of Waste Management Global, Roland Berger, UAE

**10.50 – 11.20 // Auditorium @ Expo**

**Country: Portugal**

1. **Accounting For Nature Contributions to People in A Sustainability Strategy: The Case of a Waste Management Company in Portugal**

Dr. Jane Gilbert, Malti Gadgil, Dr. Henning Friege, Kartik Kapoor, Francesca Caliesi

2. **Zero Waste for Businesses, Case Studies, and the Impact on Waste Collectors**

Hani Tohme, Senior Partner, Head of Sustainability MENA & Head of Waste Management Global, Roland Berger, UAE
Compiling Solutions to Prevent Open Burning of Waste

This session will present solutions to address open burning of waste from the perspective of multiple stakeholders, including governments, non-profit organizations, the informal sector, academia, and multi-lateral agencies. The objective of the session is to have a frank discussion of the solutions to prevent open burning of waste while assessing the barriers and opportunities to those solutions and to mobilize more stakeholders to take action to reduce open burning of waste. Case studies of interventions to prevent open burning of waste will be presented. The session will include experts from Africa, India, the United Kingdom, Japan, and the United States.

Siptex - Sweden Innovation Platform for Textile Sorting

Automated textile sorting has a key role to play in refining the increasing amounts of recycled textiles into secondary raw materials. The transition from the textile sector’s linear business models to more circular ones requires adjustments and changes at all stages in the value chain. The Siptex facility is an automated textile sorting for producing high-quality recycling products that meet the market’s needs for fibre-to-fibre recycling. It sorts textiles based on fibre composition and colour, up to 16 different fractions. The Siptex facility contributes to the creation of new markets for recycling products.

Gunilla Carlsson, Public Affairs Director, Sysav, Sweden

Smart Waste Chutes & Digital Interventions: A promising approach for influencing waste & recycling in multi-residential contexts?

Improved waste sorting and overall waste reduction are essential for achieving a sustainable circular economy. However, existing research fails to provide actionable insights due to poor data quality, a focus on single-family households and short study periods using unsuitable interventions. We present a 12-month longitudinal field study that used novel ‘smart’ waste chutes to collect objective waste data on household-level and influenced recycling behaviours of 153 households in a multi-family residential setting through a scalable, digital behavioural intervention administered via smartphone. Our findings offer promising insights into novel data collection opportunities offered by ‘smart’ technologies and the short- and long-term effects of scalable, digital interventions.

Henrik Siepelmeyer, PhD Researcher, University of Agder (UiA), Norway

What Prevents Packaging from Circularity and How to Deal with It

Today, the packaging sector is far from circular. To the loss of the environment, our resource base and to the bottom line. Cluster Manager Ola Roness leads a business and long-term approach to move beyond the usual method of working. Answers to this problem can be found in integrated waste management platforms given the increasing need to provide momentum to zero waste to landfill models. Ensuring that a net positive impact is delivered, waste management platforms need to focus on the entire process chain—from the collection, transport, segregation, and finally upcycling. At every step, integrated waste management platforms enhance accountability, environmental safety, and transparency; therefore, ensuring that nothing falls through the gaps.

Prashant Singh, CEO & Co-Founder, Blue Planet Environmental Solutions, Singapore
This session will discuss results from the innovative Clean Oceans through Clean Communities (CLOCC) particularly relevant to waste management due to its hefty million euros of investment. This innovative approach is during the project phase. During the last decade, we innovative projects, a positive social and environmental zero. At LIPOR, we found out that for every euro invested in positive externalities, otherwise it could be perceived as Although hard to capture, a value should be given to Show Me the Money: Sharing Value Through Intangibles

**Integrated Landfill Mining: A Saviour from Dumpsites**

Unscientific landfills/dump sites have been a major and continuous source of methane and underground water contamination in developing countries. With rapid urbanisation and population explosion, these dumpsites which previously were positioned outside the cities, stand now as memorials within the city limits becoming not only an eye sore but responsible for major health issues. Zigma Global Environmental Solutions’ Integrated Landfill Mining solution not only helps reclaim these dumpsites but segregates the resources and recycle/upcycle them, thus eliminating its further potential to pollute air, water, and soil. Having processed more than 7.5 million tons of waste and having reclaimed more than 300 acres of land- Zigma is poised to help mankind to free it from the perils of these mountains of trash.

**Data-Driven Waste Management. The Results Are Already Here!**

Despite the boom of digital transformation across different industry sectors, data-driven management approach in waste management is still rather rare. What it means to manage waste based on data and how does it affect efficiency, transparency and traceability? We invite the audience to learn about use cases where digital transformation completely changed the way particular stakeholders, organizations and companies operate. Based on practical examples from cities, waste collectors, take-back operators, and deposit return system administrators, I will demonstrate how accurate data allow for the transformation of the waste management industry to achieve efficiency and sustainability.

**Monitoring Local Government Waste Management in Indonesia Through National Waste Management Information System Technology**

The Directorate General of Waste Management, Waste and Hazardous Toxic Materials (PSLB3) Ministry of Environment and Forestry Republic of Indonesia created a digital platform called SIPSN to monitor waste management in local governments. Through this platform the Indonesian government can more easily assist local governments in dealing with waste problems to achieve Jakstranas (70% waste handling and 30% waste reduction in 2025) targets to improve waste management and make it more sustainable.

**Panel Discussion: Circular Economy in Randers: A Road Trip Along Challenges, Pitfalls and Successes**

Randers, the northern half of Belgium with 6.6 million inhabitants, made the circular economy spearheaded its policy a few decades ago, even before the term ‘circular economy’ itself was mentioned for the first time. Thanks to the efforts of the municipalities and their citizens, more than 70% of all household waste is collected selectively and the various collected flows are being used for increasingly high-quality recycling applications. Re-use and the sharing economy are stimulated, which also includes the aspect of social employment. The non-recyclable residual waste that remains, is processed in state-of-the-art energy from waste plants. In addition to electricity production, the roll-out of district heating networks generates a positive impact on local air quality and helps to achieve ambitious climate targets. The secret behind the success? The way in which many different actors – public and private - complement and reinforce each other, under the watchful eye of the Renish government, OVAM and Circular Randers, who design policy, continuously measure, evaluate, and adjust if necessary.

**Clean Oceans through Clean Communities (CLOCC)**

This session will discuss results from the innovative Clean Oceans through Clean Communities (CLOCC) development as contribution to a circular economy. Ola will explain how the players in the cluster cooperate to create systemic, product, material, and cultural solutions. Ola will also share on key findings regarding blockages (with special focus on FMCG plastic packaging) and point out a route toward a more circular systemic flow for the packaging sector.

**Sorting and Analysing Solutions for Plastics Recycling**

Resource scarcity, environmental degradation, and climate

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**Moderated by:**

**Corrado Chr. Lillelund Forcellati, Managing Director, PAIA Consulting**

**Speakers:**

**Nancy Strand,** Senior Advisor, Avfall Norge

**Tina Wågønes,** Managing Director, NICCE

**Marisa Soares,** VP, Farming Solutions, Africa & Asia

**Moderated by:**

**Christof Delatter,** Administrator General, OVAM, Belgium

**Piet Coopman,** Director Intervalt, Federation of Intermunicipal Waste Companies in Randers, Belgium

**Tim De Mulder,** CEO, Circular Packaging Cluster, Norway

**Kristof Bosvuyt,** Mayor, City of Wilrijk and Chairman, Board of Intermunicipal Association (ISVAG), Belgium

**Panelists:**

**Anna Lopes,** Project Manager, LIPOR, Portugal

**Peter Knaz,** Director, DRS & Take Back Systems Division, Senosone, Slovakia

**Ola Ronæss,** CEO, Circular Packaging Cluster, Norway

**Ana Lopes,** Project Manager, LIPOR, Portugal

**Nagesh Chinnartha,** Co-Founder, Zigma Global Environment Solutions, India

**Soraya Taipa,** Innovation Manager, LIPOR, Portugal

**Perdona Samudra,** Software Engineer, Ministry of Environment and Forestry, Indonesia

**Moderated by:**

**Panelists:**

**Ana Lopes,** Project Manager, LIPOR, Portugal

**Nagesh Chinnartha,** Co-Founder, Zigma Global Environment Solutions, India

**Soraya Taipa,** Innovation Manager, LIPOR, Portugal

**Perdona Samudra,** Software Engineer, Ministry of Environment and Forestry, Indonesia

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**Perdona Samudra,** Software Engineer, Ministry of Environment and Forestry, Indonesia

**Ola Ronæss,** CEO, Circular Packaging Cluster, Norway

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<th>Discussion</th>
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| 12.00 | **Lunch**                                                                                                        |                                                       | Masterplan to Zero Waste, in this session we’ll discuss about preventive solutions, regulations and concrete collaborative solutions. |**Corrado Chr. Lillelund Forcellati, Managing Director, PAIA Consulting**

**Speakers:**

**Nancy Strand,** Senior Advisor, Avfall Norge

**Tina Wågønes,** Managing Director, NICCE

**Marisa Soares,** VP, Farming Solutions, Africa & Asia
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<tr>
<th>Title</th>
<th>Speaker(s)</th>
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<tr>
<td>Engaging Residents in the Local Circular Economy Using a Digital Platform - Learning from a Pilot Study in Stockholm Royal Seaport, Sweden</td>
<td>David Enarsson, Project Manager &amp; Behavioural Strategist, LocalLife, Sweden</td>
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<tr>
<td>Circular Policy and Development in Taiwan</td>
<td>Nawaf Bilasi, CEO Advisor for Technical Affairs, National Center for Waste Management, Kingdom of Saudi Arabia</td>
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<tr>
<td>Plastic Pollution in Cities Around the World and Waste - A Comprehensive Understanding</td>
<td>Sigve Andera, Programme Director, CLOCC Global Waste Association, Indonesia, Salya Oktamalandi, Secretary-General, Indonesia Solid Waste Association, India, Dr. Vivek Agrawal, Chairman, Institute of Chartered Waste Managers, India, Dr. Anne Scheinberg, Minimisation Working Group, ISWA, Netherlands</td>
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<td>Circular Policy and Development in Taiwan</td>
<td>Michael Perl, Regional Sales Manager, SESOTEC</td>
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<td>Microplastic: A less imperceptible threat on the Peruvian Coast</td>
<td>Alberto Huiman Cruz, Peru Waste Innovation</td>
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Oceans through Clean Communities project. It will describe the project framework that uses the 7-step inclusive planning process to develop sustainable and context specific waste master plans. The project is ongoing in Indonesia and India. The session will include experts from Indonesia, Norway, and India.

The event will start with a panel of key-note speakers, providing input for an informed and interactive discussion with the participants. The diversity of the panel members will ensure a comprehensive coverage of key aspects, including technical know-how, policy issues, financing and on the ground cases. The format of the session will be a “Davos style” panel, with each panelist answering guiding/targeted questions by the moderator, followed by discussion in the panel and with the audience.

Speakers:
- Sigve Andera, Programme Director, CLOCC Global Waste Association, Indonesia
- Salya Oktamalandi, Secretary-General, Indonesia Solid Waste Association, Indonesia
- Dr. Vivek Agrawal, Chairman, Institute of Chartered Waste Managers, India
- Dr. Anne Scheinberg, Chair, Recycling and Waste Minimisation Working Group, ISWA, Netherlands

If cities are to reach their recycling and waste targets, stakeholders in the global waste industry must better understand how to motivate citizens to improve their waste sorting behaviours. This presentation summarizes insights from a pilot study in Stockholm, Sweden that explored how a new place-based digital platform can engage residents to reduce, reuse, recycle. The results suggest that the platform motivated participants to adopt more sustainable behaviours, while improving end-user satisfaction and communication between residents and waste companies. Next steps involve seeing whether the results can be maintained in an upscaling and commercialization of the concept.

David Enarsson, Project Manager & Behavioural Strategist, LocalLife, Sweden

change demand a new approach to sustainable business. The solution is a circular economy in which waste is repurposed as a valuable raw material. For profitable recycling, material purity is essential. Our intelligent technologies and services help recycling companies to profitably produce secondary raw materials of the highest quality. Material cycles are closed. Sustainability, environmental protection, and profit go hand in hand.

Sesotec is one of the market leaders in foreign material separation and sorting technology for more than 40 years. For the recycling of plastics, the systems reliably distinguish plastics with the help of various sensor technologies and efficiently separate them into colour and type-pure fractions.

Michael Perl, Regional Sales Manager, SESOTEC

Saudi Arabia’s Transformation Towards Circular Economy

Saudi Arabia is embarking on an ambitious transformational plan, Vision 2030, as it seeks to take executive action to reform the waste sector with the principles of circular economy at its heart. The National Centre for Waste Management was established as the regulator of waste management sector. Its mandate includes developing waste management policies, developing national waste management strategy, stimulating investment, issuing licenses and permits for service providers, among others. This study showcases the important steps the center’s is undertaking towards circular economy transition and presents some key challenges in realizing its ambitions, including the enablers used to support this transition.

Nawaf Bilasi, CEO Advisor for Technical Affairs, National Center for Waste Management, Kingdom of Saudi Arabia

While inducing changes, we have adjusted to better eliminate and recover products through the design in not just products but also policy and processes as the country’s initiative. We have also research and develop innovative technology for materials like PV panels, energy storage equipment, and establish material banks to improve resource efficiency, give the earth a clean and sustainable environment.

Alberto Huiman Cruz, Peru Waste Innovation
plastic pollution.
Speakers:
Costas Velis, ISWA TF Leader and University of Leeds, Academic
Gunilla Carlson, ISWA Board, TF and Communications Coordinator
Nancy Strand, ISWA Board and Senior Advisor, Avfall Norge (TBC)
Dr Josh Cotton, ISWA TF Expert, Research Fellow, University of Leeds

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<tr>
<td>Lai Ying-Ying</td>
<td>Director-General, Department of Waste Management, Environmental Protection Administration, Taiwan</td>
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<tr>
<td>15.00</td>
<td>Intermission / Tea Break</td>
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<tr>
<td>15.20</td>
<td>Welcome Remarks by ISWA World Congress 2022 Host</td>
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<td></td>
<td>Melissa Tan, Chairman, WMRAS and Organising Chair for ISWA World Congress Singapore, Singapore</td>
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<tr>
<td>15.25</td>
<td>Opening Highlights</td>
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<td>15.35</td>
<td>Welcome Address by Guest of Honour</td>
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<td>Ms Grace Fu, Minister for Sustainability and the Environment, Singapore</td>
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<td>15.55</td>
<td>Keynote:</td>
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<td>Turning the Tables on the Planetary Triple Crisis – What is the Role for the Waste Sector in Mitigating Climate Change?</td>
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<td>Synopsis to be provided</td>
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<td>Carlos Silva Filho, President, International Solid Waste Association (ISWA)</td>
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Panel Discussion #1: The Year in Review: Is Transformation the Most Powerful Ways to Realise the #SDG2030 Agenda?
The current cascading and intersecting crises have caused considerable setbacks in the progress for the SDGs completion. The severity and magnitude of the challenges requires sweeping action and a long-term transformation and implementation plan. Waste management is relevant for many SDGs and has the potential to contribute towards achievement. The question is how to accelerate and enable the sector for such objective? What can be done to accelerate technological adoption, development of resilient infrastructure, governance arrangements and financing mechanisms? This panel will discuss about the way forward on SDGs, the communication and engagement, planning and strategies as well as governance system for waste management.

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<tr>
<td>16.45</td>
<td>Panel Discussion #1: The Year in Review: Is Transformation the Most Powerful Ways to Realise the #SDG2030 Agenda?</td>
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<td>Moderated by:</td>
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<td>Sandra Maxo-Nix, Climate &amp; Clean Air Coalition, UNEP</td>
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<td>Panellists:</td>
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<td></td>
<td>Bjorn Appelqvist, Senior Chief Consultant, Ramboll and Chair, Scientific Technical Committee, ISWA</td>
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<td>Jacob Duer, President and CEO, Alliance to End Plastic Waste, Singapore</td>
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<td>Dr Axel Schweitzer, CEO, ALBA Group plc &amp; Co. KG</td>
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Panel Discussion #2: Behavioural Shift Towards Sustainability in Consumers and Businesses
Sustainability is no longer just a “good to have in mind” concept, but it has become a choosing criterion for consumers. In many surveys done by various organisations around the world, found that more than 50% of Gen Z consumers were willing to pay more for sustainable products. Has the COVID-19 pandemic fuelled the trend? are businesses increasing their offer of sustainable products to consumers? Circular considerations are increasing in relevance and waste management has a predominant position for improving such practices and closing the loops. Are instruments such as eco-labels being used to communicate to consumers about their choices? Find out what are businesses doing to engage internal and external consumers to enable their sustainability efforts and their way of contributing to the Net Zero future.

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<tr>
<td>17.35</td>
<td>Panel Discussion #2: Behavioural Shift Towards Sustainability in Consumers and Businesses</td>
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<td>Moderated by:</td>
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<td>Dr Martin Blake, Strategic Advisor, Blue Planet Environmental Solutions</td>
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<td></td>
<td>Panellists:</td>
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<td></td>
<td>Isabella Huang-Loh, Chairman, Singapore Environment Council &amp; Chairman, PMC Certification Board, Singapore</td>
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<tr>
<td></td>
<td>Dr Riva Waldman, Vice-Chair, Working Group for Communications and Social Issues, Israel</td>
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<td>Bryan Peh, Managing Director, Earth Recycling Services</td>
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<td>Olive Tai, Managing Director &amp; Co-Founder, Synagie</td>
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<tr>
<td>Time</td>
<td>DAY 2 - 22 SEPTEMBER 2022, THURSDAY // AGENDA</td>
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<tr>
<td>08.30</td>
<td>Registration</td>
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<tr>
<td>09.00</td>
<td><strong>Energy, Waste and Data - The Future</strong></td>
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<td>Steve Peters will present an emerging technology landscape, where energy and waste meet in data. From the testing of a waste to energy planning scenario tool in development by ADB called WARPS, through mobile APPs which provide agility in the waste collection industries to the opportunities for artificial intelligence in identifying underserved areas and low (or negative) impact solutions. By capturing and using data, the enterprises of tomorrow can help their customers and stakeholders to meet environmental and social commitments whilst maximizing the value of the assets within the waste supply chain.</td>
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<td>Steve Peters, Senior Energy Specialist, Asian Development Bank</td>
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<tr>
<td>09.30</td>
<td><strong>Panel Discussion: Fortifying Environmental, Social and Governance Elements for Our Future</strong></td>
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<td>Shareholders demands have increased implementation of ESG practices into business’s process and operations, and it has proven to be a tool necessary for growth – short or long term. This panel will discuss how each country incorporate ESG as a game changer to strengthen the eco-system to support both business and environmental sustainability.</td>
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<td>Moderated by: Christof Delatter, Head of Strategy and Policy, and Interim Administrator General, OVAM, Belgium</td>
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</table>
|       | Panelists:  
|       | Dr Amy Khor, WMRA Advisor & Senior Minister of State, Ministry for Sustainability and the Environment, Singapore  
|       | Dr Nori Purnomo, President Commissioner, PT Blue Bird Tbk, Indonesia  
|       | Carlos Silva Filho, President, ISWA  
|       | Steve Peters, Senior Energy Specialist, Asian Development Bank |
| 10.20 | **Fireside Chat: Financing for Waste Management Infrastructure in Lower-Income Countries** |
|       | With the Paris Agreement and Glasgow Climate Pact, there is an increasing amount of financial instruments available for climate mitigation and adaptation, being it in the form of grant, technical assistance, or investment. Such knowledge is still not made widely aware to the waste management sector. On the other hand, there is a pressing need to build sustainable waste management infrastructure in lower-income countries, which would help meet multiple UN Sustainable Development Goals and accelerate climate change mitigation. It is widely recognised that the waste sector, due to dumpsites and landfills, contributes to one quarter of methane emissions, a type of Green House Gases that is more potent than CO2 in terms of warming effect in the short term. Thus, the building of waste management infrastructure to divert waste from dumpsites and landfills must be accelerated. However, there is a huge gap between the available financing resources and the need of waste management infrastructure in lower-income countries. Investors are looking for quality projects to invest in, while projects are looking for financing solutions. This session aims to delve into these issues, revealing the barriers impeding financial flow to the projects, showcasing available financing opportunities, and helping clarify the pathway to bankable projects. |
|       | Moderated by: Richard Gult, Global Co-Head, International Projects Group, Ashurst, Singapore |
|       | Panelists:  
|       | Carl Johan Wahlund, Investment Director, Green Infrastructure, Norfund  
|       | Jiao Tang, Director of Programmes, R20, Subnational Climate Fund  
|       | Samir Dendoune, Strategic Development Director, Treatment Infrastructure Recycling & Recovery, SUEZ, France  
|       | Jasper Wong, MD, Head of Construction & Infrastructure, Sector Solutions Group, UOB |
| 11.20 | **Lunch Break**                                |
| 12.40 | **Track 1: Creating a Sustainable Living Environment** |
|       | Learning from Sustainable Waste Operations Village in Muncar Indonesia? Lessons for Indonesia  
|       | A Principle amongst the learnings from waste intervention management in Muncar Banyuwangi Indonesia was the importance of Appropriate village level regulation to ensure engagement in the service and payment of fees was legally supported and to clarify the division of responsibilities between different levels of government. There are two approaches including one with surrounding villages paying a tipping fee to a village MRF operator, whilst they operate their enterprise, and the second wider participation and in which management accountability |
| 12.45 | **Track 5: Making Sound Decisions in Waste Recovery** |
|       | Turning A Policy Info Practices by UNEP Global Mercury Partnership  
|       | The Minamata Convention on mercury stipulates in its article 1 (mercury wastes) that each Party to take appropriate measures so that mercury waste is managed in an environmentally sound manner. Because of the hazardousness, extra caution should be made at the different phase of waste management (e.g., source separation, collection, transportation, storage, and disposal backed up with sound technologies and practices, being supported by relevant policies and voluntary initiatives. |
| 12.45 | **Track 6: Health & Safety, Waste Management Requirements** |
|       | Hazards & Risks Association with Managing Healthcare Waste and How to Mitigate Them  
|       | The management of healthcare waste has reached the consciousness of the public during the recent global pandemic. Much of the PPE worn has been overclassified as healthcare waste and other wastes not given the priority they needed. Sharps from treatment or mass vaccination programmes and infectious waste from the treatment of other illnesses are likely to pose a greater risk than the waste from the care of people with COVID-19. This is mainly due to the mode of transmission of the pathogens. This session will highlight some of those hazards and how to mitigate |
| 12.45 | **APRU: Advancement on Novel Construction Materials Towards the Carbon Neutrality** |
|       | Research investigations on novel construction materials to mitigate climate change are indeed a priority for achieving the carbon neutrality by 2050, owing to that cement production was associated with high carbon emission. The application of biochar is one of the
and governance system are shared across villages. Since 2018, the implemented system successully collected 16,876 tonnes of waste and provided waste services to 90,773 people and provided 110 full time jobs.

Prasetyo Ibnutoat, governance lead, SYSTEMIQ, Indonesia
Karika Karosekali, Collection Officer, STOP Project Muncar, SYSTEMIQ, Indonesia

Bringing different sectors all together, this session aims to demonstrate how the international community responds the issues of mercury wastes and how such wastes are practically managed on the ground in order “not to Waste Our Future.”

Koji Ono, Ministry of the Environment, Japan; and Co-lead, Mercury Waste Management Area, Global Mercury Partnership

Global Framework for Sound Mercury Management
Recent development on mercury wastes in the context of the Minamata Convention and the Basel Convention

Secretariat of the Minamata/Basel Convention, Japan, and Switzerland

Effects of the Pandemic on Waste Generation and Management in Healthcare
At its height, the pandemic wrought havoc not only on people’s health and the global economy, it also seriously challenged the ability of countries to respond quickly to its immense impact on every facet of our modern lives – including waste management. Early into the global lockdowns, news on how the volume of wastes especially PPEs and other single-use plastic products skyrocketed became a serious concern. In response to this, Health Care Without Harm partnered with the Department of Health in the Philippines in conducting Waste Audits in order to understand, learn from, and respond to how the pandemic has affected the way health facilities generate waste. The presentation will share the experiences, the lessons and the results of the audits conducted by HCWH in 2020 and in 2022, and how the government is responding to the challenges.

Paeng Lopez, Plastics in Healthcare Program Manager for Southeast Asia, Health Care without Harm, Philippines

Improving Worker Safety in Solid Waste Collection and Disposal
Collecting and managing solid waste and recyclables is a very dangerous job, in both developed and developing countries. In the United States, waste collection is the sixth dangerous occupation, and there are thousands of costly injuries and collisions each year on routes and at disposal facilities. The Solid Waste Association of North America (SWANA) has developed a pro-active safety program that provides useful safety resources and information (available in 3 languages) to solid waste employers and employees in the United States and Canada. This presentation will identify the principal safety hazards and how to reduce risks workers and others and provide tips for memorable safety training events.

David Biderman, Executive Director, SWANA, USA

New Local Government SWM Index Pinpoints Capacity Needs to Help Reduce Ocean Plastics Pollution
Learn about how local governments in low-to-middle-income countries can self-assess their capacity to develop a sustainable solid waste management (SWM) system and obtain guidance to strategically invest limited resources. This index, developed under USAID’s Clean Cities, Blue Ocean (CCBO) program, is known as the Solid waste Capacity Index for Local governments (SCIL). The SCIL provides a numerical score and analysis from which a local government can evaluate, and transparently report, its status with respect to its SWM capacity needs. Attendees will hear about the objectives of the SCIL, the results of the assessment and how it helped CCBO cities.

Lori Scozzafava, Director for Capacity Development and Governance, Clean Cities, Blue Oceans, USA

Panel Discussion:
Responses to the Global Agreement
• Global forum dedicated to sound mercury management - activities of the GMP and its Mercury WM Area, highlighting ISWA factsheets for practical support
• Local government to catalyze global/national policies for actions
• Industry to provide a solution on the ground - introducing state of the art technologies to treat mercury wastes

Panellists:
-Koji Ono, Ministry of the Environment, Japan
-Municipality of Singapore
-Taeko Takashi, Secretariat of the Global Mercury Partnership Waste Management Area (GMP-WMA)
-Gabriel Chifflier, GMP-WMA industry Partner
-Nicolas Humez, Leader of the GMP Waste Management Area Working Group for resource development and Chair of Hazardous Waste Working Group of ISWA

Holistic Approach in Tackling Plastics and A Circular Economy
TOMRA was founded in 1972 on an innovation that began with the design, manufacturing, and sale of reverse vending machines (RVMs) for the automated collection of used beverage containers. Today TOMRA provides technology-led solutions that enable the circular economy with advanced collection and sorting systems that optimize resource recovery and minimize waste. TOMRA’s Holistic Resource Systems (HRS) concept developed in partnership with Eunomia to face the challenges of mismanaged, HRS takes a holistic approach to waste management based on a combination of established recycling practices, which include Deposit Return Systems (DRS), Separate Collections, and Mixed Waste Sorting (MWS). The HRS has the power to increase recycling rates, optimize resource recovery and accelerate the transition to a circular economy. Such a transition would ensure that valuable materials remain in closed loops to be used and reused in different ways and forms emulating nature itself.

13.20

13.00

13:00
The Introduction of EPR: Tackling Plastic Packaging Waste in East and Southeast Asia through International Cooperation

The “Rethinking Plastics – Circular Economy Solutions to Marine Litter” project, funded by the European Union and the German government, has facilitated the transition towards circular economy in East and Southeast Asia from 2019 to 2022. Governments, municipalities, producers, recyclers, and civil society in China, Indonesia, the Philippines, Thailand, and Vietnam have been exchanging under the project’s initiative on Extended Producer Responsibility for packaging. This presentation displays the lessons learned of the project, looking back at three years of very diverse EPR developments in the different project countries and discusses enabling and hindering factors for EPR for packaging in the future.

Speakers:
- Elena Robbow, Advisor, Waste Prevention, Gesellschaft für Internationale Zusammenarbeit (GIZ), Germany
- Christophe Pautrat, Regional COO, Landbell Group, Germany
- Sebastian Frisch, Founder & Managing Director, BlackForest Solutions, Germany

Plastic Waste to Fuel: Creating Value in Rural Areas of India

Pune city is surrounded by many villages. Their loving standards have changed but there is still no proper waste management systems in most villages. Plastic waste is either thrown or burned. There are no scientific or proper disposal methods. It was found that women of the household oversee waste. It was also established from studying of previous campaigns what are the effectiveness of various campaigns that were run to create awareness and change of habit. Community involvement along with creating awareness, efficient collection, effective recovery and giving back to community has helped the community in circular and sustainable living.

Dr Medha Tadpadikar, Co-Founder, Rudra Environmental Solutions, India

Local Municipalities Innovate with a Door-to-Door Collection of Asbestos Cement Waste

In 2018, the Flemish Government approved a target group oriented Asbestos Abatement Action Plan. This Action Plan strives for an asbestos-safe Flanders through the introduction of an asbestos inventory and the phased removal of high-risk asbestos applications by 2034 and 2040. The Flemish government and municipalities incentivize house owners to remove non-friable asbestos applications by creating an innovative low-threshold asbestos cement collection. This collection ‘at home’ is organized by the local intermunicipal corporation and supported by subsidies granted by the Flemish government. The many applications for home collection of asbestos cement show that the service will contribute strongly to the reach of an asbestos-safe Flanders.

Speakers:
- Piet Coopman, Coordinator, Interafval, Belgium
- Christof Delarter, Head of Strategy and Policy, and Interim Administrator General, OVAM, Belgium

The composition and sources of litter in public spaces in the Greater Accra Metropolitan Area: Towards effective waste governance

The presentation outlined the results of the physical composition and branded litter audit in four public spaces in Metropolitan Accra. In summary, 37,280 pieces of litter were counted, with 11,910 branded belonging mostly to local enterprises. Plastic (79%) dominated, and 205 covid-related litter were counted. Beverage-related, food-related and plastic-related litter were dominant. All the public spaces attracted more litter than the health facility and the plastic was more likely to be counted than other litter types. Thus, interventions must be inwards-looking with emphasis on plastic and covid-19 related litter. Brand owners must be nudged to actively participate in post-consumer waste management.

Rebecca K. Yandam, Senior Research Officer, Zoomlion Ghana, Ghana

Reuse of Recycled Plastics for Plastic Road

Plastic usage is increasing day by day due to population growth, urbanization, development activities and frequent changes in the lifestyle, and the disposal and management of plastic has been difficult. Since they have high decomposition temperature, high resistance to ultraviolet radiation and are mostly not biodegradable; they can remain on both land and sea for years causing environmental pollution. Therefore, recycling, and reusing plastic waste can solve a major environmental problem. One such reuse of plastic is use of plastic for asphalt pavement, known as Plastic Road. In many countries around the world, recycled plastic has been used in flexible pavements to increase the stability, durability of roads and to reduce the cost of construction of roads by replacing some percentage of bitumen with that of the waste plastic.

Dr Sahadat Hossain, P.E. Director, Solid Waste Institute for Sustainability (SWIS), University of Texas at Arlington, USA

Turning Hazardous Waste to Resources

Hazardous waste caused detrimental effects to human health and the environment. In Malaysia, hazardous waste or better known as scheduled waste were generated through industrial and manufacturing processes. The country expels 7,185,227.76 tons of scheduled waste as of 2020, with 79 percent increase from 2019. CENVIRO through its subsidiary Kuadifi Alam owns and operates the largest integrated hazardous waste management center in the region. Through its Environmental Preservation and Innovation Centre (EPIC), CENVIRO marches towards sustainable waste management by imposing hazardous waste back into useful material streams and sources via turning the waste to wealth.

Dr Shanmuga Kittappa, Manager, Research and Development, Environmental Preservation and Innovation Centre, Malaysia

14.00-15.00 //Auditorium @ Expo

ISWA Young Professionals Group Session

Opportunities for a Global Circular Economy with Plastic Recycling

The plastic recycling industry is at a crossroads. With large volumes of materials, insufficient capacity for material recovery and processing and significant increases to demand from brands, where do new technologies,

Dr Medha Tadpadikar, Co-Founder, Rudra Environmental Solutions, India

Value Added Products From Spent FCC Catalysts

Nearly 20,000 tonnes of spent fluid catalytic cracking (FCC) catalyst waste are produced in Singapore every year. To prevent the disposal of these materials at landfill, the propose a process that converts spent FCC catalysts into value added materials for sale. The process is milder, utilizes CO2, and

Dr Medha Tadpadikar, Co-Founder, Rudra Environmental Solutions, India

Hazardous Waste Management in Oman

The Sultanate of Oman recognizes the environmental issues that arise from the illegal dumping of hazardous waste. Studies show that Oman generates around 1.5 million tons of industrial waste. To overcome this issue be‘ah has been working on developing the strategy and establishing the
15.40 The Need for Carbon Capture Storage to Reach Climate Challenges

Johnny Stuen, General Manager, Rebound Plastic Exchange, Abu Dhabi

Recupera: Reverse Logistics Program for Packaging in General

Dione Manetti, CEO, Pragma Soluções Sustentáveis, Brazil

Production and Use in Organic Farming of Quality Compost in the Republic of San Marino

Professor Giulio Ferrari, GFAmbiente Srl; Department of Territory and Environment of R:S.M., Italy

Good Practices to Separate Collection of Households Hazardous Wastes

When it comes to hazardous waste, priority consists in ensuring the separated collection of hazardous waste from non-hazardous waste. It is particularly true for household hazardous waste (HHW). These wastes represent a minor fraction of the household waste but, at the same time, may have a major impact on health and the environment. In this field, practices vary between regions, between countries and even between cities in the same country. The ISWA HW WG intends to gather the best practices and to recommend the safest solutions to collect and treat the household hazardous wastes appropriately while preventing risks and protecting health and the environment.

Additionally, the ISWA project TRP+ (Training Resource Package+) will also be launched at this session.

Alan Encinas, Technical Programme Manager, ISWA

15.00 Intermision / Break

15.20 TRACK 4: WASTE MANAGEMENT IN AN ERA OF NEW ENERGY

Carbon Capture, Usage and Storage (CCUS) Standardized for Waste-to-Energy

The presentation will describe philosophies upon developing a test pilot plant based on a large-scale industrial plant developed for other industries and processes. It will also give some results from campaigns. This pilot has run to capture CO2 from a large WtE plant, and the implications of these campaigns and results have made it possible to develop standardized solutions for carbon capture for small and medium sized WtE plant and lower the CAPEX for these plants without increasing OPEX.

Johnny Stuen, Chair of Waste to Energy Working Group, ISWA

Preventing and Removing Contaminants from Organic Wastes

The presence of contaminants in recyclable waste presents a particular challenge for organic waste recyclers, due to the high level of moisture and the diverse range of substances and items that may be present. The ISWA working group on the biological treatment of waste (WGBW) recognises the challenges faced by organics recyclers and is developing an issue paper on how contaminants can be prevented and/or removed from organics. The session will summarise the work to date by introducing the main types of contamination, examples of how technology suppliers have configured facilities to remove or manage contaminants, as well as the impact effective communication campaigns can have on contaminant prevention.

Dr. Jane Gilbert, Chair of Biological Treatment of Waste Working Group, ISWA

15.40 TRACK 5: MAKING SOUND DECISIONS IN WASTE RECOVERY

The Need for Carbon Capture Storage to Reach Climate Challenges

Maryam Al Mansoori, General Manager, Rebound Plastic Exchange, Abu Dhabi

Good Examples of Recycling from Hazardous Wastes

Salma Al Busaidi, Planning Lead, Be’Ah, Oman

Agricultural Plastics – Policy Mechanisms to Reduce

Jane Gilbert, Chair of Biological Treatment of Waste Working Group, ISWA

15.20 TRACK 6: HEALTH & SAFETY, WASTE MANAGEMENT REQUIREMENTS

Comprehensive Concept for the Safe Recycling of Hazardous Wastes

Knowing that hazardous substances must be part of the picture of the Green Deals and because most of the materials contain chemicals, it is of utmost importance to assess how to pass the information across the value chain until the waste management sector and ensure a clear and adequate alignment between chemicals, products, and waste legislations. This would require paying particular attention to decontamination in order to avoid legacy substances or substances of concern to remain in the material loops through recycling.

Nicolas Humez, Chair of Hazardous Waste Working Group, ISWA

ISWA WOW! (Women of Waste Session)

During the UN Environment Assembly 5th meeting, members states agreed to undertake negotiations toward an international legally binding instrument on plastic pollution. Yet, the Informal Recycling Sector (IRS) has received relatively limited attention in this process.

The Informal Recycling Sector (IRS) plays a crucial role in increasing the recovery of plastics and could provide a solution to plastic pollution. Therefore, ISWA’s Women of Waste Task Force, in
Goals
Sysav has set an ambitious environmental target, in 2030 the company should be climate positive, meaning that both the fossil and the biogenic part of the carbon dioxide must be removed. This will also help the city of Malmö to reach its climate goal that the city will be climate neutral in 2030. This can only be achieved by a Carbon Capture facility at Sysav stands for more than 70% of the city of Malmö carbon offset. The presentation will focus on the challenges and the benefits, the process, and the technique of the CCS-facility.

Gunilla Carlson, Public Affairs Director, Sysav, Sweden

Contamination of Soil
Ten million tonnes of plastic products are used terrestrial agricultural production every year. They include greenhouse and mulching films, sludge wrap, and drip irrigation tap all of which help farmers to increase production while reducing demand for inputs including water, pesticides, and fertilizers. However, all 10 million tonnes become waste or leak to the environment. The Food and Agriculture Organization of the United Nations is about to start a consultation process for the development of an International Code of Conduct on the use of plastics in agriculture. This presentation will discuss policy options to balance these benefits and trade-offs and especially those that reduce contamination of soils.

Richard Thompson, Agricultural Plastics and Sustainability Specialist, Food and Agriculture Organization of the United Nations (FAO), Italy

Asia
Yes, recycling from hazardous wastes is possible as long as there is no decontamination, high quality and demand from downstream users are respected. Numerous examples exist and some of them merit to be showcased. Nevertheless, some constraints still hamper the development of recycling and specifically in a big and very diverse region like Asia where transfers of hazardous waste from countries of generation to countries where investment in waste recycling technologies is more secure are not so easy.

Matt Stanelos, Director of Operations, Veolia Southeast Asia, Singapore

Systematic Thinking on Carbon Emission Reduction of Municipal Solid Waste Treatment
Multi-source solid waste should be treated in the Eco-industrial Park to maximize the reduction of carbon emission. In 2020, 15 million tons of CO2 emission could have been reduced in China if the wet waste was treated only in Eco-industrial Park (CO2 reduction by MSW incineration in the same year was 5.18 million tons). The adoption of larger grate, higher steam parameters and thermoelectric cogeneration technologies in MSW incineration plant contributes 0.9~5 million tons of CO2 reduction, annually. The Eco-industrial Park, with Chinese characteristics, was recommended to be applied in developing countries, contributing China’s solutions to the carbon emission reduction.

Zhan Liang, General Manager, International Business Department, Shanghai SUS Environment

How Food Waste Can Be Handled Appropriately – by Centralized or Decentralized Approach
Food Waste contributes substantially to municipal solid waste, and if not treated properly, it will generate greenhouse emissions. The traditional food waste treatment facility is either a large, centralized facility or a small, decentralized facility in the city center. Now there is a new satellite approach to integrate compact turnkey food waste recycling solution in the city with decentralized pre-treatment for food waste at specific sites. This approach can lower transport costs reduce traffic congestion and serve as an engagement tool for the local community.

Jude Chow, CEO, AEL International, Hong Kong

How can we incentivize collaborative work between all stakeholders? What is missing? What the existing systems and experiences could do to help developing countries to improve waste management systems? Which complementary regulations do we need to support the EPR implementation?

These and other questions will be addressed.

Moderated by:
Mariusz Brzozka – WGGLI Member and Strategy Director of Reciclad’or, Rumania

Track 7:
Drivers and Actors in Achieving the Triple Bottom Line - Profits, People and Planet

Climate Change Costs of Plastics in South Asia
Discarded plastic does not only contribute to marine litter but also to climate change. We estimate that ca. 18 million ton of plastic consumed annually in South Asia generates more than 80 million ton of CO2-eq in 2018. According to our study, the GHG emissions caused by plastics are expected to increase up to 138.87 million tons of CO2-eq in 2030. Annual climate change related costs of plastics can reach up to $14.25 billion in 2030.

Nina Tsydenova, Environmental Specialist, World Bank Group, Singapore

The Increasing Role of Bio-Methane Production in the Circular Economy Applied to Biowaste Recycling: Outlook and Case Study from Italy for 2030
The presentation starts from highlighting how Italy succeeded in being EU best performing country for collecting food waste from about 50 million inhabitants. It will then show how recycling infrastructure evolved from compost production toward the use of biowaste as a resource to produce biogas and biomethane, a renewable fuel to be used for heating or transport in cities that substitute the need for LNG or CNG. Data presented rely on Italy’s outlook of the circular economy strategy applied to food waste aiming to produce by 2030 about 250-300 m3/y of biomethane, an amount sufficient to fuel all trucks used nationwide to collect MSW.

Massimo Centemero, General Director, CIC (Italian Composting and Biogas Association), Italy

Now is the Climate Moment for Waste
Environmentally Green Lixiviants for Extraction of Precious

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Environmentally Green Lixiviants for Extraction of Precious

Track 7:
Drivers and Actors in Achieving the Triple Bottom Line - Profits, People and Planet

Challenges for Extended Producer Responsibility (EPR) Implementation in The Developing World
In this session, the Working Group on Governance and Legal Issues, and the Working Group on Recycling and Waste Minimization will be working together with the participants to address the main challenges for the implementation of EPR in developing and developed countries. Case studies from different places of the world will be presented and discussed in a roundtable with members of the WG group and guests from different international organisations working with EPR.

How can we incentivize collaborative work between all stakeholders? What is missing? What the existing systems and experiences could do to help developing countries to improve waste management systems? Which complementary regulations do we need to support the EPR implementation?

These and other questions will be addressed.

Moderated by:
Mariusz Brzozka – WGGLI Member and Strategy Director of Reciclad’or, Rumania

Panellists:
• Dirk Nelen, Vice-Chair ISWA Working Group on Recycling and Waste Minimization, Belgium
• Kartik Kapoor, OIZ, CALCC project consultant, India
• Yvonne Linn, Materials Expert, WWF
• Tze NI Yeeh, Circular Economy Manager Danone, Consumer Packaged Goods Forum
• Malli Gadgil, Programme Manager - Asia, Plastic

India Session: Challenges in Waste Management and Unlimited Opportunities

1. Decentralized Solid Waste Management: Zero Waste Cities
Mannan Singh, member, Punjab Infrastructure Regulatory Authority

Shantanu Anand, master student, Indian Institute of Technology
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<th>Time</th>
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<tr>
<td>17.00</td>
<td>Future Fuels: A Transition to Clean and Low Carbon Fuels</td>
<td>Michael Harrison, Partner, Ashurst, Singapore</td>
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<td>17.20</td>
<td>Latest developments for Waste to Energy</td>
<td>How to connect to carbon capture and production of MeOH, among others. Also, the possibility to use WIE as a means for Power to X, and producing H2, and at the same time deliver negative carbon emissions.</td>
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<td>Full Sustainability Assessment of an Electric Car NMC Battery Recycling</td>
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<td>Solutions Fund</td>
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<td>Rapid urbanization and significant economic growth of the past few decades have resulted in increased consumption of natural resources and increased waste generation in India. A report by the Press Information Bureau in 2016 put India's annual waste generation at 62 million tonnes, &quot;with an average annual growth rate of 4 per cent&quot;. On daily basis, the country produces more than 1.50 lakh metric tonne (Mt) of solid waste, according to a 2019 India Today report. Current systems in India cannot cope with the volumes of waste generated by an increasing urban population, and this impacts on the environment and public health. The challenges and barriers are significant, but so are the opportunities. Panellists at this session will discuss the challenges and subsequent unlimited opportunities associated with the waste and resources sector in India.</td>
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<td>Beyond Good Intentions and Idealism? How to Pay for Waste Management and Recycling in Developing Economies through Innovative and Unorthodox Fiscal Instruments</td>
<td>This research piece draws on both practical industry and desktop scientific research on the operational governance, green financing, and economics of innovative and global, unorthodox financing instruments that are helping to prop up both SWM and waste valorisation value chains across developing economies.</td>
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<td>Innovative Double Closed Loop Process for Recycling Li-ion Battery</td>
<td>Lithium-ion battery (LiB) being the most used generator for portable electronic devices as well as e-mobility. After end-of-life important quantity of hazardous solid wastes is produced, but the composition of LIB imposes a particular consideration due to the environment impact and valuable resources in this waste. Current processes target only expensive metal (cobalt and nickel). However, in lithium-ion batteries, other elements are now considered as critical. A new process of LIB recycling will be presented. Recovery of valuable materials must be more and more fitting with reuse as electrode materials leading to first Closed loop and creating a real Circular Economy converting the solid waste to “Urban Ores” coming from a real “Urban Mine”. Hydrometallurgy processing is accompanied with water release loaded with. Recovery this resources and reuse of water in upfront process is the Second Closed Loop. This unique process is the only one allowing the Double Closed Loop with very low carbon print.</td>
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<td>Building Robust Governance and Securing Sufficient Funding for Waste Management: Lessons from SYSTEMIQ’s Experience</td>
<td>The European Union proposed a ban on the sale of new petrol and diesel cars from 2035. It is estimated that 240 tonnes of waste e-vehicle batteries were generated in 2021. This massive e-vehicle battery waste stream will demand end-of-life (EoL) management that considers all relevant sustainability indicators. Within TripleLink, an EU funded project, we take a closer look on the pre-treatment and recycling technologies of e-vehicle batteries. A case study where a Nickel-Manganese-Cobalt battery</td>
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<td>19:00</td>
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Dr Fritz Bruehl, General Manager, MARTIN GmbH, Germany

Pyrometallurgical recycling process was simulated for two furnace feed scenarios: 1. whole battery without any pre-treatment, 2. Battery materials after physical separation process.

Diana Bizarro, Sustainability and Circular Economy scientist, TNO, Netherlands

Inadequate waste system governance and insufficient waste system funding. This session will share key findings from the research and Systemiq’s experience in improving waste governance and bringing more funding into the waste system.

Lincoln Sihotang, Senior Program Manager, SYSTEMIQ, Indonesia
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<tr>
<th>Time</th>
<th>Track 4: Waste Management in an Era of New Energy</th>
<th>Track 5: Making Sound Decisions in Waste Recovery</th>
<th>Track 7: Considerations for Economic Success in Plastic Recycling Structure</th>
<th>09.00 – 10.00 // Auditorium 8 Expo</th>
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<td>9.20</td>
<td>How to Choose - What Aspects Do You Need to Consider in a Waste-to-Energy Project?</td>
<td>This dialogue session on Waste Wise Cities Tool will introduce Waste Wise Cities Tool and at the same time showcases the findings on the status of SWM in World Cities, drawing the data and information collected since 2020. It also delves into what collaboration between ISWA, and UN-Habitat could be explored, to respond to the global trend for the waste management, including Global Methane Pledge and the global agreement on plastic pollution.</td>
<td>Circular economy for plastics is achievable by understanding the recycling cost structures and technologies - from sorting to recycling. Understanding essential facts and figures, for example of specific costs numbers for washing and regranulation, how many lines required depending on technical inventories, and the input and output qualities, then it will be able to shed light on achieving key figures for economic success like yield rates, energy efficiency, waste management and plant availability and drawing the sums will become clearer and that circular economy for plastics will be successful economically when being de-coupled from the oil market.</td>
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<td>The ISWA Working Group on Energy Recovery will present the work done in their newest publication: the ISWA White book on Technologies for WTE. This publication is intended to assist stakeholders involved in the development of Municipal Waste Management solutions, especially decision-makers (mostly Public Authorities) in countries where Ew is not yet well-known or implemented. The session will give an overview of the publication, lay out the objectives and engage in questions with the audience. Christophe Cord’ Homme, Vice Chair of Waste to Energy Working Group, ISWA, France</td>
<td>Moderated by: Philip Heylen, Business Development Manager, Ackermans &amp; van Haaren, Belgium</td>
<td>Considerations for Economic Success in Plastic Recycling Structure</td>
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<td>The future waste management with increasing recycling of waste will give opportunities for using new advanced technology. More sophisticated collection and sorting technology will result in many more clean and homogeneous waste streams. This will give the basis for new technologies as chemical looping, a technology that will transform waste into hydrogen and CO2 and at the same time also produces excess energy for electricity and heat. The goal is to have an in-situ CO2 Capture process and at the same time produce hydrogen. The principle in chemically looping will be presented and discussed. Ole Hedegaard Madsen, Director, Babcock &amp; Wilcox, Denmark</td>
<td>Francesca Caliessi, Associate Officer Solid Waste Management and Energy, UN-Habitat, Nairobi</td>
<td>The World Bank Group (WBG) leads Multilateral Development Banks in financing and knowledge development for municipal solid waste management (MSWM). However, a recent evaluation by the Independent Evaluation Group finds that even though WBG advocates for waste hierarchy and circular economy approaches, it has yet to mainstream them into many country strategies and operations. Following the IEG evaluation, WBG has committed to identifying and working to address constraints to investments in MSWM in developing economies, raise the profile of MSWM at policy-making levels in collaboration with developmental partners and the private sector, and set a course for the circular economy.</td>
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<td>09.40</td>
<td>The Future of Advanced Technology in Waste Management</td>
<td>Carlo Silva Filho, President, ISWA</td>
<td>Transitioning to a Circular Economy: An Evaluation of WBG’s Support for Municipal Solid Waste Management (2010-2020)</td>
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<td>10.00</td>
<td>From Landfill Problem to the Hydrogen Economy</td>
<td>Handling Of Liquid Waste and Industrial Wastewater - Process Selection Up to Zero Liquid Discharge (ZLD)</td>
<td>Triple Impact Valuation Matrix</td>
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<td>The presentation will describe the development of a new reworking process to produce H2 from CH4. It will also describe (although known technology) how CH4 can be produced from food waste, and other biological waste streams. This CH4 is taken through a process route that easily produce two very clean fractions of H2 and CH4, and there will be a description of process steps chosen and equipment chosen to make this process industrial and viable in an industrial scale.</td>
<td>Due to climate crisis the use of water becomes an increasing economical factor with global impact. Similar to industrial production handling of waste is producing liquid emissions such as leachate. For both complex applications intelligent process selection for treatment of liquid waste is the key to create multistage processes for efficient removal of contaminants – up to water re-use or Zero Liquid Discharge (ZLD).</td>
<td>Sustainable activities are based on a vision that combines two objectives, to generate the due economic return on investment and, in the same range of importance, to guarantee a positive impact on the environment and society, respecting this philosophy in all the processes. They are also known as a triple impact activity, since they have a positive economic, social and environmental impact. Unlike traditional companies or businesses, their focus is on optimizing the economic return instead of maximizing profits at any cost. The challenge is the measurement of impacts, for which we propose the use of a matrix.</td>
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DAY 3 - 23 SEPTEMBER 2022, FRIDAY // AGENDA

Johnny Stuen, WTE and CCS Onshore Area Manager, Kanta AS, Norway

10.20 Using Advanced Landfill Closure and Solar Technologies to Transform Landfills into Renewable Energy Assets

A new, advanced solution has been implemented in recent years to close landfills and beneficially reuse the landfill space for solar energy development. In this solution, an engineered turm final cover, ClosureTurf®, is used instead of the traditional soil cover; and a rackless photovoltaic (PV) solar system, PowerCap®TM, is used instead of the traditional racking-supported PV solar system. This advanced solution presents several benefits, including minimal site maintenance, fast installation, more area (i.e., side slopes) to use for power generation, and minimal impact on landfill performance. It can transform liabilities of closed landfills into long-term renewable energy assets.

Ming Zhu, Director of Engineering Services, Watershed Geosynthetics, USA

10.40 Multifuel Combustion in Southeast Asia: A Case Study and Why the System Could Contribute to a More Efficient WM

MSW is highly variable and difficult to combust efficiently. Without separated collection, the implementation of a Mechanical Recovery Facility is essential. The inorganic output is an RDF with high energy value and uniform combustion characteristics. RDF can be used on its own, or together with biomasses, in multifuel plants, operating at higher efficiencies than classic incineration (31% vs 22-24%). The organic fraction can be treated separately with Anaerobic Digestion to maximise the value extraction from MSW. This integrated approach creates a highly efficient solution for handling MSW that solves problems of waste residues, whilst producing efficient local power.

Matteo Molena, Business Development Director, DP Cleantech, Thailand

11.00 Evaluating the Energy Potential of 16 Landfill Gas to Energy

Evaluating the Energy Potential of 16 Landfill Gas to Energy

Frank Notau, Business Development Water Processes, Wehrle, Germany

RDF Plant Promoted Tel-Aviv Metropolitan to 40% Recycling Rate Within 3 Years

The RDF plant is a successful initiative of Dan Region Association of towns, which treats 3,500 ton/day of municipal waste. The fuel substitute that produced is the most significant solution to the plastic waste especially due to the problems that characterize the recycling market in Israel. The technology was adapted to sort the mixed MSW generated in Tel Aviv metropolitan and turn it into a homogeneous product that meets the requirements of the cement plant. While the State of Israel has been at the same recycling rate of about 20% for 15 years, the RDF plant managed to launch the Tel Aviv metropolitan area within 4 years to 40% recycling rate.

Gil Livne, CEO, Dan Region Association of Towns, Former Mayor of Shoham, Israel

10.30 Financing Waste Management

Well-functioning waste management is crucial to health and environmental protection, liveability and welfare. In addition, sustainable integrated waste management provides secondary raw materials, nutrients, green energy and greenhouse gas mitigation. Despite of this, in many parts of the world securing the funded needed to provide well-functioning waste management is challenging and a very small fraction of international development investments and aid goes into waste management. To address this situation, ISWA has formed an initiative on the Financing of Waste Management.

Fernando Bernardes, CEO, Central de Custódia, Brazil

The ISWA Financing Waste Management Initiative aims, through collaboration with relevant stakeholders, to involve different subject-matter experts to create a common dialogue and knowledge platform that prepares, presents, and analyses data, knowledge, and perspectives on the financing of waste management and the benefits of improved waste management. Furthermore, the platform is intended to facilitate constructive dialogue between public authorities, financing institutions, academia, and the waste management sector.

In this session, the initiative is launched by:
- Introduction to the ISWA initiative on Financing Waste Management
- Short introductions to financing of waste management from the perspective of an international finance institution

Lucia Barcia, CEO of IMPACTOS AMBIENTALES S.A., Argentina

Recycling Credit Certificate in Brazil

The Brazilian Solid Waste Policy determines that manufacturers, importers, distributors, and traders of products sold in packaging are obliged to implement, structure, and operate reverse logistics systems, upon return of products after use by the consumer. The results of these systems must be submitted to an independent verifier, which acts to avoid the collision of traceability documents - electronic invoices for the sale of recyclable materials - and, consequently, the duplicity of accounting, and to prove the veracity, authenticity, uniqueness, and the additivity of data referring to packaging recycling.

Speakers:
Fabricio Soler, Executive Committee, Felsberg Law Firm, Brazil
Lucia Barcia, CEO of IMPACTOS AMBIENTALES S.A., Argentina
### Projects in China to be Finance by IFC

International Finance Corporation (IFC) is planning to finance 24 landfill gas (LFG) to energy projects in China, including ten sites that are already under operation. The project developer (NCWI) provided IFC with waste data and LFG generation and recovery projections for 16 of their project site landfills that indicated there was a sufficient supply of recoverable LFG to support their planned facility capacities. In 2021, IFC hired SCS Engineers to evaluate the NCWI estimates and prepare a report providing independent LFG generation and recovery projections for the 16 landfills. The results of SCS’s evaluation will be presented at the conference.

**Alex Stege**, Senior Project Advisor, SCS Engineers, USA

### Separation Behaviour in an Urban Environment

Positive participation of the public is essential for making source-separation programs successful. A field experiment to examine effective behavioural intervention was carried out in an urban environment. The methodology for behaviour analysis relies on real-time waste sampling, for monitoring households’ behaviour in multi-apartment buildings. Giving direct information in households was proven to be the most effective tool. The addition of normative-social feedback was not found to be effective. It is possible that if the behaviour of neighbours is visible to each other, it replaces the social pressure created by an external source. In addition to quantitative measures, a new behavioural index that combines 3 indicators: performances, persistence, and compliance is presented. This index helps decision-makers to assess households’ behaviour and design local policies in accordance.

**Dr Riva Waldman**, Director of Communication & Education, Dan Region Associations of Towns, Israel

### Realizing A World of Zero Waste with Gasification Technology

While the whole world is passionate about sustainability, only 13.5% of the global 2.01 billion tonnes of municipal solid waste generated annually is being recycled. With a vision to turn waste into a valuable resource, Green Desert has successfully developed and deployed Gasification - a closed-looped and environmentally sustainable waste treatment technology – on a commercial scale in Vietnam. The solution can transform and repurpose all municipal and industrial solid waste into useful end-products, including Syngas, a clean renewable energy, and Biochar, fertile black soil that can breathe new life into nutrient-depleted lands and enhance organic farming. In this presentation, Green Desert will share hands-on experience about how we are creating such valuable products from waste as well as a complete circular economy with Waste Gasification.

**Hai Dang**, Project Manager, Green Desert Company Limited, Vietnam

### From the perspective of a private equity firm

- From the perspective of a recipient of financial assistance
- Panel discussion with participation of the presenters

### Country Session: Middle East

Waste management has become a major environmental challenge across the Middle East due to high waste generation rate, lack of disposal sites, and absence of sustainable waste management strategies. Studies suggest that annual solid waste generation in the Middle East has exceeded 150 million. In the past, a lack of legal and institutional frameworks has been a major stumbling blocks in the progress of the waste management sector. However, in recent years, steady progress has been made in the region. There are still challenges to be overcome, but there are significant opportunities. Speakers at this session will present innovative strategies being implemented in their countries and discuss the challenges as well as the opportunities associated with the waste and resources sector in the Middle East.

1. **Challenges and Opportunities of Applying Industrial Symbiosis as a Driver for Circular Economy in the Kingdom of Saudi Arabia**
   - **Meshari Al Quwayzani**, General Director, Senior Development at the National Center for Waste Management in Saudi Arabia

2. **Business Opportunities in the Waste Management Sector in Oman**
   - **Essam Al Sharji**, Department Head of Corporate Affairs, be’ah, Oman

### Break

11.40

### Closing Keynote: Conclusion and What’s Next?

**Bjorn Appelqvist**, Chair of Scientific Technical Committee, ISWA, Denmark
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<th>Time</th>
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<td>12.10</td>
<td>Memorandum of Understanding Signing Ceremony ISWA &amp; Alliance to End Plastic Waste</td>
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<td>12.25</td>
<td>Closing Remarks and Handing Over Ceremony</td>
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<td>12.45</td>
<td>END OF ISWA WORLD CONGRESS 2022</td>
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<td>14.00</td>
<td>Technical Visits</td>
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