

2023 資源循環國際研討會

RESOURCE CIRCULATION

International
Conference

Organized by



行政院環境保護署
Environmental Protection Administration,
Executive Yuan, R.O.C. (Taiwan)



EU
OFFICE
European
Economic
& Trade
歐洲經貿辦事處

Co-organized by



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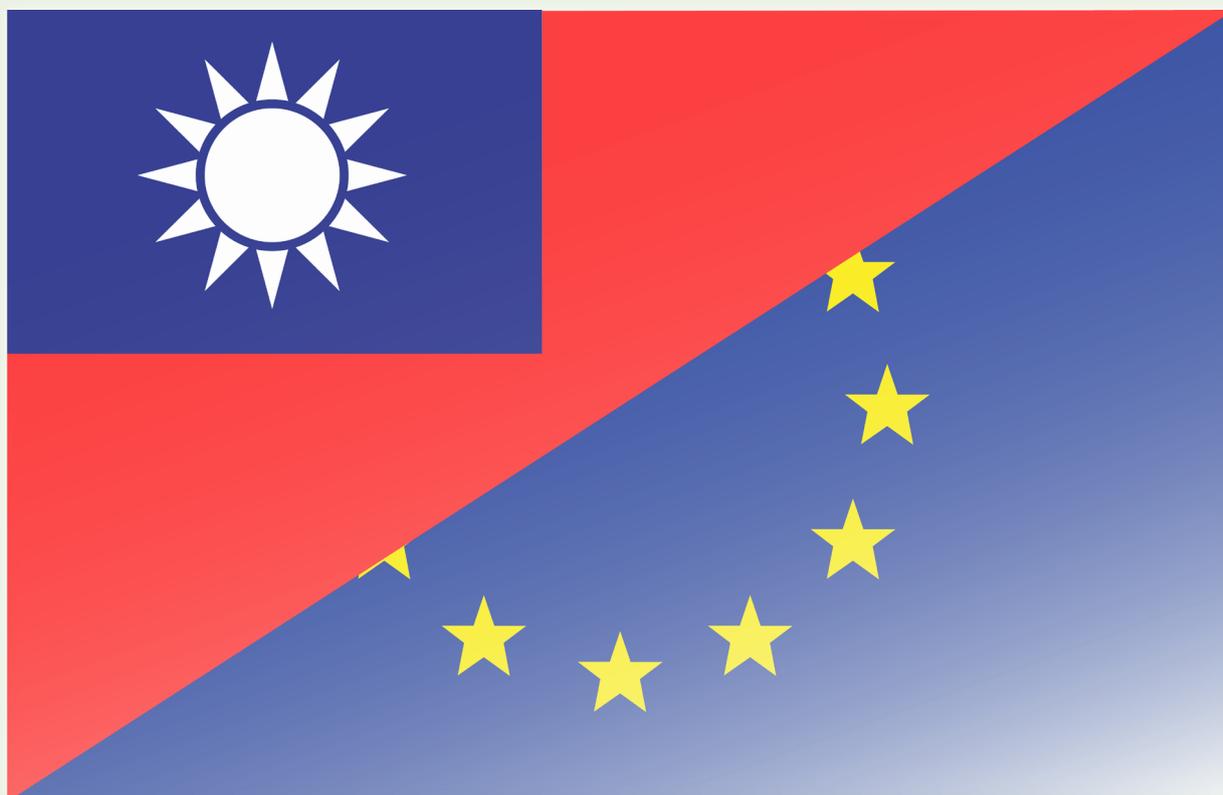
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BACKGROUND

For this conference we shall be inviting representatives from academia and industry, and researchers and experts from Europe and Asia to explore topics including policies on resource circulation, plastic resource circulation, ecological design and business models of sustainable products, and Turning Waste to Energy.

The conference aims to explore policies on resource circulation and industrial development as well as achievements in innovative research and development in resource circulation in various countries, strengthen international interactions and exchanges of ideas relating to resource circulation, accelerate interdisciplinary communication, provide references for countries to formulate policies relating to resource circulation, enhance the profile of green start-ups in the international community, and showcase Taiwan's efforts and achievements in resource circulation.



MINISTER'S WORD





MINISTER'S WORD

Thank you for attending the 2023 Resource Circulation International Conference. On behalf of the EPA, I would like to warmly welcome all experts and delegates from home and abroad who have joined us for this important and meaningful international event.

As an island economy, Taiwan relies heavily on imported resources. It consumes nearly 270 million metric tons of raw materials and generates about 32 million metric tons of waste each year, of which 11 million metric tons are general waste. Recently, it reached a recycling rate of 57.3%, and from its 22 million metric tons of business waste, it achieved a reuse rate of 86.5%.

Through our efforts over the past 20 years, Taiwan has made great progress in resource recycling. However, we still want to pursue our vision by going one step further to achieve our goal of full resource circulation and zero waste. In March 2022, in order to align with global trends, Taiwan announced its “Net Zero by 2050 Roadmap”. This roadmap includes 12 key strategies for transition to net zero, of which the EPA is responsible for the implementation of Strategy 8—Zero Waste Resource Circulation. We use the strategies of green design to achieve source reduction, energy and resource reuse, and an efficient circular network; and we use innovative technology and systems to help us formulate measures and take concrete actions to reduce the use of virgin materials, turning waste into usable materials, fuels and fertilizers.

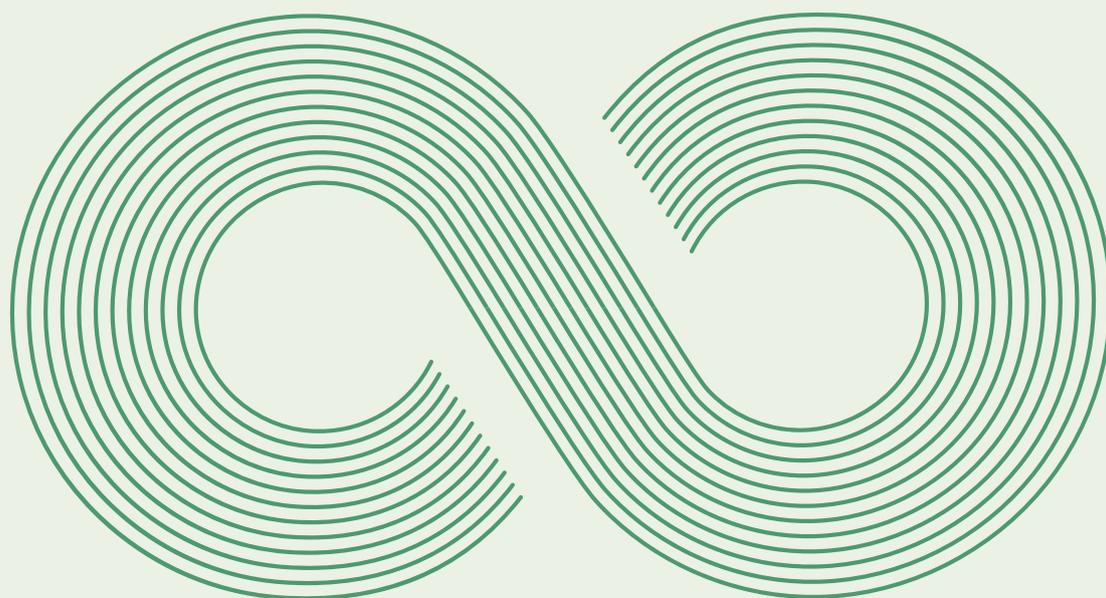
As for improving the regulatory system, the EPA has started the legislative process for a special act on resource circulation. This new act will flip the concept of waste management by focusing on management of material life cycles and better resource utilization, source management and producer responsibility. Through these steps, we can create a favorable environment for resource circulation and reach the goal of "maximizing resource utilization and minimizing waste."

Demonstrating our commitment to the environment and sustainable development, on May 24, 2023, President Tsai announced the Organizational Act of the Ministry of

Environment, to transform the EPA into the Ministry of Environment and establish the Resource Circulation Agency, which will take charge of overall resource circulation policy and management. The new Agency will transition the focus from solely waste management to four key material categories—namely biomass; organic chemicals; metals and chemicals, and; inorganic recycled aggregates—and will adopt a full life-cycle approach to manage these materials. It will also promote the conversion of waste into resources and energy through measures such as green design, reduction, enhanced recycling and resource circulation.

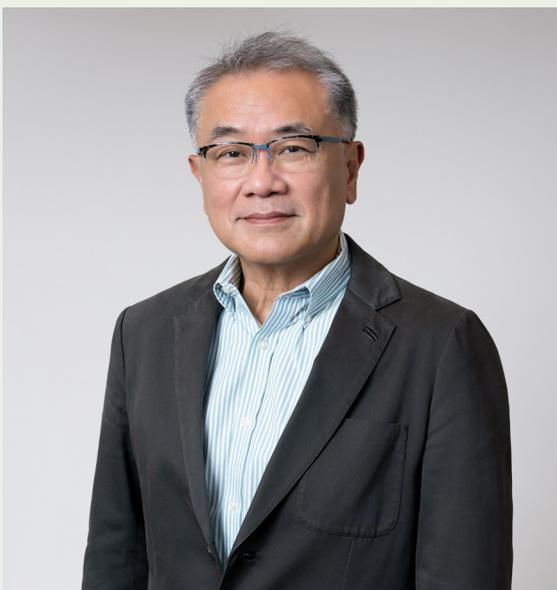
We sincerely thank all conference participants for your contributions in the field of resource circulation. We hope what we share at this gathering will inspire even greater visions. Through our connections made and collaborations between different industries, we will continue to advance resource circulation and sustainable development in the world. Let's work together to build a better and sustainable future.

**Chang Tzi-Chin, Minister of
the Environmental Protection
Administration (EPA)**



MODERATORS





CHARLES HUANG
Founder and Chairman,
Circular Taiwan Network

Career

- Global Solutions Initiative – CESD Sounding Board Member
- Chair Professor of Academy of Circular Economy, National Chung Hsing University
- Chairman of Taiwan Sugar Corp.
- Chairman and CEO of TSRC Corp.
- Senior consultant to CTCI Group
- Consultant of Booz.Allen & Hamilton
- Analyst of Exxon International
- Board of New Frontier Foundation
- Board of Hao-Ran Foundation
- Founder of Association of Food Waste Compost Promotion

Education

- Master of Business Administration, University of Pennsylvania Wharton School
- Bachelor of Science in Chemistry, University of Pennsylvania



RICHARD FAN

Honorary President, Circular
Economy and Innovative
Transformation Association

Career

- Director, Office of Science & Technology Advisors, EPA
- CEO, Foundation of Waste Reduce, Reuse, and Recycle, Taiwan
- Professor and Vice President, National Kaohsiung University of Science and Technology, Taiwan

Education

- Ph.D., Environmental Engineering, The Ohio State University, USA
- M.E., Environmental Engineering, Iowa State University, USA
- B.E., Department of Civil Engineering, National Chung-Hsing University, Taiwan



HWONG-WEN MA
Professor, Graduate Institute
Environment Engineer, NTU

Career

- Professor, Graduate Institute Environment Engineer, National Taiwan University
- Director, Graduate Institute Environment Engineer, National Taiwan University
- Secretary General, Chinese Institute of Environmental Engineering
- Chair, Environmental Planning and Management Committee, Chinese Institute of Environmental Engineering

Education

- PhD, Department of Environmental Sciences and Engineering, University of North Carolina at Chapel Hill, NC, USA
- Master of Science in Public Health, Department of Environmental Sciences and Engineering, University of North Carolina at Chapel Hill, NC, USA
- Master of Science in Engineering, Graduate Institute of Environmental Engineering, National Taiwan University, Taipei, Taiwan
- Bachelor of Science, Department of Chemistry, National Taiwan University, Taipei, Taiwan



YOUNG KU

Chair Professor, Department
of Chemical Engineering,
NTUST

Career

- Executive Officer, Taiwan Institute for Sustainable Energy
- Vice President, Taiwan Research Institute
- President, Taiwan Environmental Management Association
- President, The Chinese Institute of Environmental Engineering
- Chairman, National Committee for Environmental Protection Standards

Education

- Ph.D in Environmental Engineering, Purdue University, USA, 1986
- MSc in Chemical Engineering, University of Kentucky, USA, 1982
- B.S. in Chemical Engineering, Tunghai University, Taiwan, ROC, 1977

SPEAKERS





MAIVE RUTE

Deputy Director-General & Chief Standardisation Officer, DG Internal Market, Industry, Entrepreneurship and SMEs (GROW)

Career

As Deputy Director-General in GROW, Maive Rute focusses on green transition of industries, resilience of supply chains, promotion of investments, standardisation and IP rights. In June 2022, European Commission nominated her the first ever Chief Standardisation Officer.

Between 2005 – 2019, she has worked as Director for Entrepreneurship and SMEs, and as Director and DDG in the research and innovation field of the European Commission.

She has also served as Deputy Governor of the Bank of Estonia and CEO of KredEx, the Estonian business and export financing body.

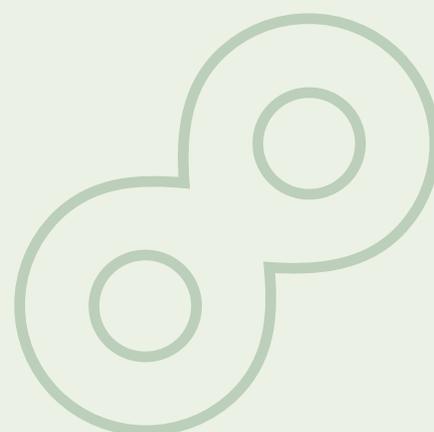
Circularity in Europe: From Regulation to Business Cases

Abstract

With global population reaching 8 billion in 2022 and global demand for resources quadrupling since the year 2000, the adoption of new production and consumption models has never been more important. One of the solutions to this problem in the legislator's toolkit is the promotion of circularity in all aspects of our societies. And yet, while Europe and other regions are making significant progress, there's a need to walk-the-talk in order to accelerate this transition.

For circular economy to become a mainstay in the growth models of advanced societies, there is a need to make a business case for circular products and businesses. The key to ensure a transition towards circular, and thus greener, economies is to showcase how such initiatives are rational, respond to business logic, and justify undertaking these transformative steps.

This presentation will cover the general framework of the EU's approach to circularity, including the 2020 Circular Economy Action Plan, and the Ecodesign for Sustainable Products Legislation. It will further place its focus on three sectors where circular approaches are being pursued – raw materials, textiles and construction – to demonstrate the areas where definitive action is being taken to promote business cases that pursue the greening of the economy through circularity.





YING-YING LAI

Director General, Office of
Resource Circulation, EPA,
R.O.C. (Taiwan)

Career

- Director, Office of Resource Circulation, EPA
- Director General, Department of Waste Management, EPA
- Executive Director, Soil and Groundwater Remediation Fund Management Board, EPA
- Deputy Director General, Department of Supervision Evaluation & Dispute Resolution, EPA
- Deputy Director General, Department of Waste Management, EPA

Education

- Ph.D., Institute of Natural Resource Management, National Taipei University
- Bachelor of Science, Department of Environmental Engineering, National Cheng Kung University

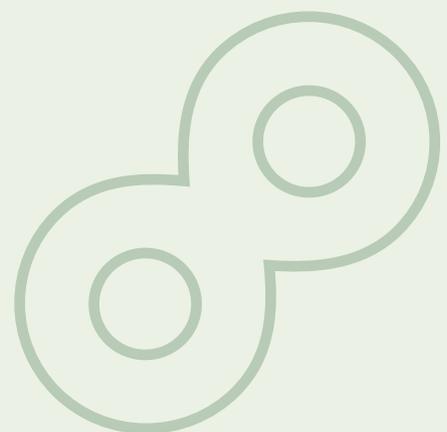
Development and Policy of Resource Circulation in Taiwan

Abstract

In Taiwan, the annual direct material input amounts to approximately 300 million tonnes, resulting in a waste production of approximately 32 million tonnes. The Taiwan Environmental Protection Administration (EPA) guides industrial producers to use recycled materials, create a secondary material market and enhance material circularity through the establishment of standards, quality criteria and guidebooks.

The EPA promotes resource circulation through various policies and measures, including financial tools and collaborative mechanisms such as the 4-in-1 Recycling Program. Additionally, green modulated fees have been developed to incentivize producers to manufacture circular and regenerative products. In the future, the resource circulation facilitation fee will be used to encourage the final use of reused products.

To work with Taiwan's goal of achieving net-zero emissions by 2050, the EPA assumes the primary responsibility in implementing the Resource Recycling & Zero Waste Strategy. The EPA focuses on four key strategies: green design for waste reduction at the source, resource reutilization and the conversion of waste into resource and energy, the establishment of a well-functioning circulation network, and technological and institutional innovation. To transform the mindset around waste management, the EPA plans to enact the Resource Circulation Facilitation Act and implement organizational reforms to drive policies and actions towards resource sustainability.





RON WONG

Director, Waste Management
Division, National Environment
Agency, Singapore

Career

Ron is the Director, Waste Management Division of the NEA.

The Division aims to achieve an efficient and sustainable waste to resource management system in Singapore.

It is responsible for the regulation of the Waste Collection Industry, the Public Waste Collection scheme, General Waste Disposal Facilities, the Extended Producer Responsibility and Mandatory Waste Reporting schemes.

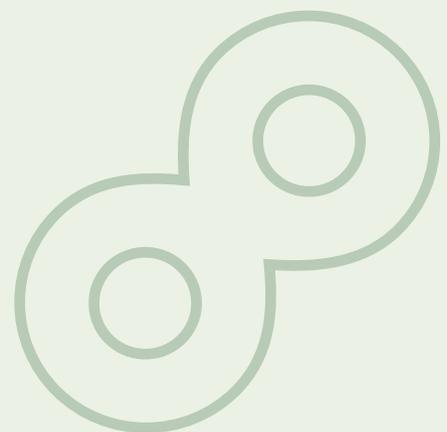
The Division implements new initiatives under the Zero Waste Masterplan.

Singapore's Key Strategies to Build a Sustainable and Resource-efficient Nation

Abstract

Singapore has shown how economic growth, environmental protection and social inclusion can go hand in hand. But we face new challenges. As a low-lying island-state, climate change threatens our way of life and existence. Addressing how we manage waste together with Singaporeans goes a long way in tackling climate change. Moreover, our only landfill, Semakau Landfill, will run out of space by 2035 at current waste disposal rates.

The Zero Waste Masterplan lays out the vision and various strategies to move Singapore from a linear take, make, and throw economy, to a circular one, tying in with the Sustainable Living pillar of the Singapore Green Plan, a roadmap of sectoral plans and targets for Singapore. The strategies and efforts aimed at promoting circularity have helped Singapore close the loops of several resource streams, such as metals and construction and demolition waste. Learning from experience and working on the momentum to drive further results, Singapore has introduced measures targeted at closing the loop for 3 priority waste streams – e-waste, food waste, and packaging waste, including plastics. These measures include the introduction of legislations, innovation and development of waste management infrastructure, collaboration and educational engagement with industry and community.





RICCARDO TUFFI

Researcher, Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA)

Career

1. Full-time researcher (from 2012 -)
 - ENEA – Italian National Agency for New Technologies, Energy and Sustainable Development
 - Department of Sustainability
 - Division Resource Efficiency
 - Laboratory Technologies for the Reuse, Recycling, Recovery and valorization of Waste and Materials -T4RM
2. Research fellow (from 2010 to 2012)
 - ENEA – Italian National Agency for New Technologies, Energy and Sustainable Development
 - Department of Sustainability
 - Division Resource Efficiency
 - Laboratory Technologies for the Reuse, Recycling, Recovery and valorization of Waste and Materials - T4RM
3. Non-fixed term contract (from 2010 to 2012)
 - Italian Institute for Environmental Protection and Research (ISPRA)
 - Technical support to the IPPC (Integrated Pollution Prevention and Control) Commission of Ministry of Environment for applicant chemical and petrochemical plants.

Education

- PhD degree in Industrial and Environmental Hygiene, Sapienza University of Rome (from 2004 to 2007)
- Industrial Chemistry Master Degree, Sapienza University of Rome (19.12.2002)

Opportunities and Challenges of Chemical Recycling of Plastic Waste -The Italian Experience

Abstract

The trend of plastic production has increased significantly every year until 2019, in which this trend stabilized around 375 Mt, and then increased again to 391 Mt in 2021. Furthermore, most of this plastic is used for packaging and consequently becomes waste very quickly. Unfortunately, plastic waste is often disposed of inappropriately, causing environmental problems and an avoidable waste of resources. In 2019 the European Circular Economy Action Plan has been issued in order to encourage recycling, with a strong focus on plastic waste. Nevertheless, nowadays post-consumer recycled plastics in Europe accounted only for 10%. Almost all commercial plastic recycling plants use mechanical recycling routes. Mechanical recycling refers to a physical/thermal reprocessing of plastic wastes into new products different from the initial items, preceded by the essential steps of separation of foreign materials, washing and sorting. In Italy, among the various plastic wastes, only PET and HDPE from packaging are routinely recycled. Furthermore, mechanical recycling fails to efficiently recycle mixed, partially degraded or contaminated plastic waste. Then, there is an acute demand for new, efficient and cost-effective recycling technologies to fill the gap left by mechanical recycling. Chemical or tertiary recycling is considered a good complementary alternative because it can process heterogeneous waste streams composed of different polymers. Chemical recycling is divided into solvent-based and thermochemical technologies and aims to convert plastic waste into chemicals and monomers that are then used again as a raw material in chemical processes. Currently in Europe, only around 50 kt of plastic waste is chemically recycled but the road is marked. In Italy, the National Recovery and Resilience Plan, Investment 1.2 – “Lighthouse” projects for circular economy has allocated 150 M€ for the plastic waste line. Of the 134 project proposals presented, about 20% concern the construction of new plants based on chemical recycling technologies.





EVA LUO

Senior Vice President,
Polyester Industry,
Far Eastern New Century

Career

- Professional sales experience in top 5 world-class PET manufacturers. Key account manager of international beverage and FMCG brands. Demonstrates sustainable and recyclable business model
- Speaker of circular economy topic for Global Cooperation and Training Framework in 2020
- Speaker of the 30th Joint Economic Cooperation Meeting Between CIECA and FTI in 2022
- Speaker of FENC Investor Relation Events of Taipei Innovative Textile Application Show (TITAS) since 2016 till now

FENC Sustainable Material & Circular Economy

Abstract

FENC is a global leader in sustainable polyester materials and circular economy with a vertically integrated production-sales structure and regional supply chain advantages to market high-performance products worldwide.

Based on sustainable governance and environmental protection principle, FENC has been processing post-consumer recycled (PCR) PET bottles for high valued applications since 1988. FENC has been recognized by global beverage brands as their sustainable and reliable partner on their road toward green mission.

Taiwan has a robust recycling system with PET bottle recycling rate over 95%. FENC is the worldwide Top 3 food grade rPET producer, and the first to received Taiwan FDA Letter of Non-Objection. We will continue providing high quality food grade rPET by operating cutting-edge recycling technologies with years of experience and help fulfill plastic circular economy in Taiwan.

FENC integrated multiple resources and environmentally friendly products from FENC vertical chain, developing high performance functional and sustainable fabrics for international brands. Not only satisfy the everyday wear of end consumers, FENC is also a major supplier at global sporting events, such as World Cup FIFA, NBA etc.





PETER CALLIAFAS
Advisory, United Kingdom
National Materials Datahub
Development

Career

- DEFRA INDUSTRY WORKING GROUP ON WASTE AND RESOURCE DATA: Member of working group (2019 -)
- UK NATIONAL MATERIALS DATAHUB DEVELOPMENT: Advisory (2017 -)
- ACCELERATING GROWTH FUND: Retained consultant (2009 - 2020)
- E.WASTE.R Project: Retained consultant to WAMITAB (2015 - 2018)
- WASTE MANAGEMENT INDUSTRY TRAINING & ADVISORY BOARD: Trustee and Board Director (2008 - 2015)
- NORTH LONDON WASTE AUTHORITY PROCUREMENT PROGRAMME BOARD: Non-Executive Director (2009 - 2013)
- LONDON WASTE AND RECYCLING BOARD: Independent Member (2008 - 2012)
- TETRONICS LTD: Board Director (2004 - 2007)
- BARCLAYS BANK PLC: Relationship Director and Head of Environmental Services Team (1980 - 2004)

Education

- London Guildhall University (evenings): B.A (Hons) Financial Services. Thesis Corporate Culture (1996 - 1998)
- Associate Chartered Institute of Bankers (1988 - 2004)
- Member, The Chartered Institution of Wastes Management and Audit Committee(2005 - 2016)

Challenges in the Circular Economy Business Model – Moving Away from Virgin Materials

Abstract

The growth in the global economy, in technology and technical applications, and in consumerism demand, has led to a consensus that ‘business as usual’ cannot continue. As a result, the linear economy business model has served its purpose in my view.

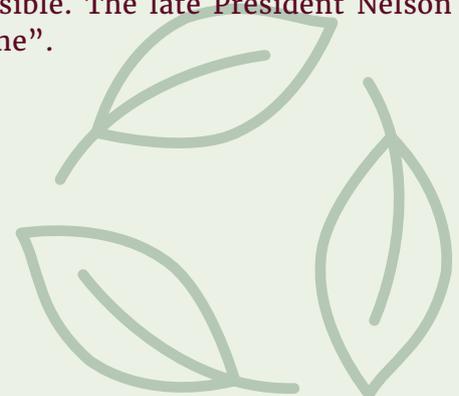
Sustainability is now centre stage, driven by the price / risk impacts arising from the supply side of finite resources (Critical Raw Materials – Lithium / Cobalt being examples, as well as Rare Earth Elements – the 17 metallic elements, with some of these being an essential part of smart phones, computers for example).

There is a growing pressure on business, and on its boards, to move to a circular economy business model; this pressure being derived from policy and regulation, green finance, institutional investors, NGO’s and shareholders. In parallel, we have climate change impacts, and Net Zero (scopes 1,2,3) impacting too.

The 2023 Circularity Gap Report, by Deloitte, says that “The global economy is now only 7.2% circular; and it’s getting worse year on year – driven by rising material extraction and use”. This highlights the extent of the challenge that needs to be overcome in terms of business model change. There is not ‘a one size fits all’ circular economy business model. Each business sector will have to adapt its principles to make it relevant and applicable to them.

My presentation will focus on some relevant business cases which showcase the circular economy business model in action, how policy and regulation, sustainable design can catalyse this change, and the importance of the consumer in all of this.

The change from a linear economy business model to a circular one will not be easy, nor without its risks / challenges, but it is not impossible. The late President Nelson Mandela said “it always seems impossible until it’s done”.





BORIS BOEHME

Director, ICT Technical
Regulation, Federal Ministry
for Economic Affairs and
Climate Action (BMWK)

Career

Boris Boehme has been Director for ICT Technical Regulation and Standardization, Product Safety and Market Surveillance at the Federal Ministry for Economic Affairs and Climate Protection (BMWK) since 2015. He is the coordinator of the Global Quality Infrastructure Project (GPQI), which works internationally with partner countries on quality infrastructure issues.

Mr. Boehme worked on the German standardization roadmap for the circular economy, with a particular focus on the digital product passport. In the Ministry of Economic Affairs, he coordinates the regulatory design of the digital product passport at EU level and its implementation in industry.

He began his professional career as a desk officer in several positions in the German Parliament and then moved to the Federal Ministry of Economics as a personal adviser to the minister and has held management positions in parliament and government since 2011.

The Digital Product Passport as an Enabler for the Circular Economy

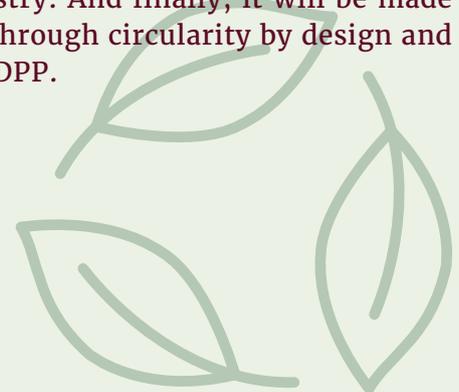
Abstract

The UN, EU and Germany have committed themselves to the overriding political goal of greenhouse gas neutrality. A circular economy can and must be key to achieving zero emissions across the product range. The circular economy is implemented in the EU internal market through action plans, and Germany is also developing a national action plan.

A circular economy is only possible by transferring data on the composition of individual products along the supply chain. This requires a digital product passport (DPP) assigned to the product as a data carrier. Consumers, economic operators as well as market surveillance and customs authorities can read the required information from the DPP via a unique identifier attached to the product.

Product information is already being tracked by law today in order to prove the conformity of products with government product requirements and to inform consumers about the nature and intended use of products. The internationally practiced system of quality infrastructure has proven itself for this. In addition to safety and security requirements, ecological requirements such as the Product Carbon Footprint (PCF) will increasingly be formulated in the future. A DPP will allow the government to review these requirements. In the future, this data will be made accessible via a DPP product pass to enable a circular economy.

The presentation will put in context the essential role of the DPP as a enabler of the circular economy. Using the example of the digital EU battery passport, it will be explained how legal regulations can be implemented with DPP, thus enabling worldwide circularity of batteries. Using Industry 4.0 as an example, it will be illustrated how the industry can create digital twins with DPP, how the PCF can be verified along the supply chain and how a DPP will also be a driver for the industry. And finally, it will be made clear that circular economy can only be made possible through circularity by design and tracking the necessary product information only via a DPP.





ARTHUR HUANG
CEO & Founder, Miniwiz

Career

Arthur is a structural engineer, architect, and leader in circular economy innovation with MINIWIZ, a trash material technology company he started in 2005. The mission of MINIWIZ is to UPCYCLE decades of single-use environmental “pollution” into sustainable smart building “solution” of the future.

Arthur’s MINIWIZ team leapfrogs existing technology / empowers circular economy for all communities. MINIWIZ technology platform captures the value of single-use plastic, metal, glass through decentralized waste transformation machines to convert industrial and household wastes into sustainable building materials, building modules, specialty fabrics, designer furniture/fixtures. After 2 decades of innovation focusing on impactful upcycling technologies powered by a multi-national/multidisciplinary team, MINIWIZ is now offering its modular infrastructure as an ESG specialty contractor to the global market to make circular concept into physical reality. MINIWIZ’s upcycled experimental products already implemented in over 300,000 sqm of commercial retail, hotels and offices across major international cities.

Under Arthur’s leadership, MINIWIZ has received numerous international invention patents in manufacturing processes / mechanical assemblies to enable circular consumption. Arthur was recognized by various international institutions including the World Economic Forum’s Technology Pioneer Award, Obama’s Emerging Leader, the Financial Times’ Earth Award, and The Wall Street Journal’s Asian Innovation Award. Arthur has been a National Geographic Emerging Explorer since 2016 and the World Economic Forum recognized him as the Runner up for The Circular Leadership Award 2019 Davos. In February 2019, the World Economic Forum named MINIWIZ as one of the top 11 companies leading the way to a circular economy.

Zero Waste and Beyond

Abstract

The trash problem we find ourselves immersed within is an opportunity to transform the way we design, engineer, and manufacture. It can become the new building blocks of society and has potential to power the circular economies of the future. The first step is to convert the waste we see into a sustainable solution by engineering trash into beautiful and functional products we actually want to buy. This is the future but it is also the now.





VIVIAN WU

Director of Industry Foresight
Section Taiwan Design Research
Institute

Career

- Co-Principal Investigator of the Design Technology Research and Development Co-Creation Program (2023~)
- Co-Principal Investigator of the Design Driven the SMEs to Implement the Net-Zero Carbon Emissions Program (2022~Now)
- Director of Industry Foresight Section, Taiwan Design Research Institute (2021~Now)
- Project Director of the Kaohsiung City Design Economics Assistance Programs (2022)
- Project Director of the Design Driven the Strategy of the Water Culture Innovation with Public Space, Landscape Aesthetics Action Plan (2021~2022)
- Project Director of the Design Driven the Eco Night Market Project (2021~2022)
- Principal Investigator of the Design Driven the Circular Economics and Circular Value Chain. (2021)
- Project Director of the Chiayi City Design Economics Assistance Programs (2020~2021)
- Director of Business Transformation and Empowerment Section, Taiwan Design Research Institute (2020~2021)
- Co-Inventor of the MAC Ward System. (2019~2021)
- Director of American Innovation Center (2017~2020)
- Project Director of the Designomics Programs (2017~2020)
- Director of Industry Constant Section, Taiwan Design Center (2012~2019)
- Director of Strategic and Planning Section, Taiwan Design Center (2009~2012)

Designing for a Green Future

Abstract

Green. It has physical, spiritual and metaphysical associations. The heart meridian, governing the immune and endocrine systems, is associated with this color, explaining why it is linked with healing. For the eco revolution, it is both symbol and synecdoche. And thanks to that revolution, going green is no longer an isolated concept but an everyday necessity that is essential to the healing of our greater physical body, our planet.

How we achieved the Green Future? We should to start thinking how we design, create, produces and use the product or service every day. Circular design is a mindset, also known as circular economy design or cradle-to-cradle design, is an approach to design that aims to eliminate waste and create a sustainable and regenerative system. It seeks to decouple economic growth from resource consumption and environmental degradation. In circular design, products and materials are designed with the intention of being kept in use for as long as possible. The goal is to create a closed-loop system where resources are continually reused, recycled, or regenerated, rather than being disposed of as waste. Circular Design emphasizes the following key principles:

1. Design for longevity: Products are designed to be durable and long-lasting, using high-quality materials and construction techniques. This extends their lifespan and reduces the need for frequent replacement.
2. Design for reuse: Products are designed to be easily disassembled and repaired, allowing for components or materials to be reused or refurbished. This approach promotes the idea of a product's lifecycle consisting of multiple uses.
3. Design for recycling: Materials used in products are selected with recycling in mind, ensuring that they can be easily separated and processed for future use. Design considerations include choosing recyclable materials, avoiding hazardous substances, and creating standardized components.
4. Design for regeneration: The aim is to design products and systems that contribute to the regeneration of natural systems. This involves incorporating renewable energy sources, supporting regenerative agriculture practices, and minimizing negative environmental impacts.

Circular design can be applied to various sectors, including manufacturing, architecture, fashion, and transportation. It encourages collaboration and innovation across industries to develop sustainable solutions and optimize resource use. By adopting circular design principles, businesses and communities can reduce waste, conserve resources, and create economic and environmental benefits. Overall, circular design offers a holistic and forwardthinking approach to design, aligning economic prosperity with environmental sustainability and social well-being. Here, we look to the future of green.



VIVIAN TAI
Lead of Global Product
Sustainability Strategy

Career

Vivian is currently the Lead of Global Product Sustainability Strategy. Prior to this role, Vivian used to serve as the Head of Dell Environmental Affairs & Producer Responsibility for Asia-Pacific & Japan, where she leads the team across various Asian countries and is responsible for assuring market access through strategic alignment on product compliance with focus on the environmental requirements. She is also closely engaging with key stakeholders, Regulators, NGOs, and Agencies to influence both global and regional policy and standards.

Vivian owns professional specialties in the areas of product stewardship, environmental policy & risk management, green supply-chain management, environmental economics, and project management. In the course of her career, she brings extensive experience in the planning and execution of environmental compliance strategy and end-to-end design for environment activities across the entire product portfolio.

Vivian holds a Bachelor's degree in Agri-Chemistry from National Taiwan University and a Master degree in Environmental risk and management from Harvard University.

Our Purpose in Action: Dell's ESG Strategy

Abstract

“Recycle it all, no matter how small” – the theme of International E-Waste Day 2022 reminds us that discarded, unused electronics, or e-waste, present one of the fastest-growing global environmental challenges of our time. It is estimated that more than 57 million tons of electronics will be discarded in 2022 and the number is still increasing.

This is equivalent in weight to 82,000 school buses or 4,700 Eiffel Towers – enough to cover the size of Manhattan – and that's just e-waste production in a single year.

Only 17.4 percent of that volume is recycled as e-waste each year. With that said, Dell will share its vision and strategy and how the company puts the circular economy in action.





STEPHEN STURROCK PETERS

Senior Energy Specialist (Waste-to-Energy), Energy Advisory Sector Group, Sustainable Development and Climate Change Department, Asian Development Bank

Career

Authored ADB handbook “Waste to Energy in the Age of the Circular Economy”, Multiple media releases on waste to energy, waste from the covid-19 pandemic, ocean health, methane abatement, ocean investments and oped on Asia’s waste crisis. Led the MARES technical assistance linking marine renewable energy, food production, coastal protection and livelihoods. ADB operations highlights were waste to fuels technology on ADB funded biomethane plant to fuel the Karachi Red Line BRT and integrated energy from waste in China.

Co-chair of Hunan Low Carbon Development Forum 2018 & 2019. Chair of 2023 High Level Investor Forum on New Ocean Energy Economy.

Led W2E biogas developer as CEO/engineer/founder – built and converted sales pipeline, attracted project investment and led company through 2008 Global Financial Crisis. Set up consulting and development services company in biomass, biogas, landfill mining and other renewable energy sources with distribution throughout ASEAN and Australia.

Led team on due diligence of AES ASEAN biogas asset sales and rural waste study in Thailand for E.ON Masdar Integrated Carbon Ltd.

Founding chairman of the Asia Pacific Biogas Alliance, an industry association for biogas and related technologies and co-author of SEAS white paper adopted as Solar Nova Program (2014).

Education

- University of Melbourne – Master of Engineering Science (By research in project management of complex project environments) (1992-1995)
- University of Melbourne – Bachelor of Engineering (civil and environmental) (1983-1986)

Energy, Waste and Data – The Future

Abstract

Energy and waste sectors create enormous amounts of data. By employing digital tools, significant insight can be generated. This insight allows for discovery of commercial and economic benefits whilst warning of social and environmental challenges. Steve Peters will share some of the tools ADB is developing. Simulations of waste management and circular economy supply chains have been employed in South East Asia as well as nascent artificial intelligence enhanced tools for waste tracking. This works is the beginning of wider digitally enhanced capabilities in development.





JEAN LIU
Chairman, Yuen Foong
Yu Inc.

Career

- International Strategic Account Director, Schneider Electric
- Director, Ecosystem, CTO Office, Delta Electronics
- Manager of Business Development, IBM Research-China
- Managing Consultant, Global Business Services, IBM Taiwan

Education

- Ph.D., Chemistry, Northwestern University
- Master of Science (M.S.) in Computer Engineering, Northwestern University

Circular YFY: Biomass Energy Towards Low- Carbon Transformation

Abstract

Companies face daunting challenges when it comes to energy transformation. Biomass energy is an often overlooked yet important renewable energy source. It possesses carbon-neutral characteristics and holds the potential to enhance energy independence. YFY has long been committed to circular economy and has successfully developed large scale biomass energy facilities in Taiwan. YFY's biomass energy implementation includes lignin, biogas, and SRF cogeneration system. Moving forward, YFY will continue its endeavors in circular economy and strive towards low-carbon transformation.





CHIA-CHI CHANG

Senior Researcher, Taiwan
Bio-energy Technology
Development Association

Career

- Taiwan Bio-energy Technology Development Association: Senior research fellow (Jan.2017 – Present)
- Graduate Institute of Environmental Engineering, National Taiwan University, Taipei, Taiwan: Postdoctoral fellow (Jan.2014 – Jan.2017)
- Sitech Services, Inc., Taipei, Taiwan: Project manager (Feb.2013 – Jan.2014)
- Graduate Institute of Environmental Engineering, National Taiwan University, Taipei, Taiwan: Postdoctoral fellow (Oct.2009 – Jan.2013)
- Depart. Environ. Eng., National Ilan University, Ilan, Taiwan: Assistant Professor (2009 – 2012)
- Depart. Safety, Health and Environ. Eng., Ming Chi University Of Technology, Taipei, Taiwan: Assistant Professor (2009 – 2012)
- Depart. Safety, Health and Environ. Eng., Ming Chi University Of Technology, Taipei, Taiwan: Lecturer (2007 – 2009)

Education

- National Taiwan University (NTU), Taipei, Taiwan: PhD of Environmental Engineering (Sep. 2003 – Sep. 2009)
- Feng Chia University, Taichung, Taiwan: Master of Environmental Engineering (Sep. 1998 – Jun. 2001)
- Feng Chia University, Taichung, Taiwan: Bachelor of Environmental Engineering (Oct. 1994 – Jun. 1998)

Waste-to-Energy Technology and Achievements in Taiwan

Abstract

Since 1984, Taiwan has built 26 waste to energy (WtE) plants by incineration, treat more than 6.5 million tons municipal solid waste (MSW) and produce over 3,200 million kWh electricity per year. Due to the change of MSW composition for last 30 years, the waste to fuel (WtF) method had been proposed to improved WtE efficiency.

Since 2019, Taiwan Environmental Protection Agency (EPA) start the promoting the WtF policy to convert non-hazardous combustible solid waste to solid recovered fuel (SRF) that can be used in industrial boilers and combustion devices. This further promotes the energy recovery of waste, achieving the benefits of reducing coal use and greenhouse gas emissions. By solid management of waste source, sorting equipment, SRF quality control and end user, the annual production of SRF has reached 200,000 metric tons in 2022, which can replace 155,000 metric tons of coal and reduce 132,500 metric tons of greenhouse gas emissions. Compared to incineration, WtF conversion can increase 300 million kWh power generation per year.



AGENDA



2023 RESOURCE CIRCULATION INTERNATIONAL CONFERENCE

Event Date: Monday, 29 May 2023 09:00–17:00

Event Venue: 4F-VIP Room, Taipei International Convention Center (TICC)

Event Guests: Official executives from the Executive Yuan, Environmental Protection Administration, Ministry of Economic Affairs; foreign guests and industry-academia representatives.

TIME	AGENDA
EIW Grand Opening	
08:15–09:00 (45 mins)	Registration
09:00–09:30 EIW Grand Opening (30 mins)	Opening Remarks <ol style="list-style-type: none"> 1. Ms. Maive RUTE, Deputy Director-General, DG Grow 2. Mei-Hua Wang, Minister, MOEA, R.O.C. (Taiwan) 3. Official executives, Executive Yuan, R.O.C. (Taiwan) Group Photo
2023 Resource Circulation International Conference	
10:00–10:05 (5 mins)	Opening Performance
10:05–10:10 (5 mins)	Opening Remarks Tzi-Chin Chang, Minister, EPA, R.O.C. (Taiwan)
Keynote Speech: Resource Circulation Policies	
10:10–11:25 (Moderator:15 mins) (Speaker:20 mins each)	Moderator: Charles Huang, Founder and Chairman, Circular Taiwan Network
	Circularity in Europe: From Regulation to Business Cases Maive RUTE, Deputy Director-General & Chief Standardisation Officer, DG Internal Market, Industry, Entrepreneurship and SMEs (GROW)
	Development and Policy of Resource Circulation in Taiwan Ying-Ying Lai, Director General, Office of Resource Circulation, EPA, R.O.C. (Taiwan)
	Singapore’s Key Strategies to Build a Sustainable and Resource-efficient Nation Ron Wong, Director, Waste Management Division, National Environment Agency, Singapore

TIME	AGENDA
Session 1: Plastics in Resource Circulation	
11:25-12:00 (Moderator:5 mins) (Speaker:15 mins each)	Moderator: Richard Fan, Honorary President, Circular Economy and Innovative Transformation Association
	Opportunities and Challenges of Chemical Recycling of Plastic Waste - The Italian Experience Riccardo Tuffi, Researcher, Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA)
	FENC Sustainable Material & Circular Economy Eva Luo, Senior Vice President, Polyester Industry, Far Eastern New Century
12:00-12:15 (15 mins)	Panel Discussion
Session 2: Ecological Design and Business Models of Sustainable Products	
14:00-15:20 (Moderator:5 mins) (Speaker:15 mins each)	Moderator: Hwong-Wen Ma, Professor, Graduate Institute Environment Engineer, NTU
	Challenges in the Circular Economy Business Model-Moving Away from Virgin Materials Peter Calliafas, Advisory, United Kingdom National Materials Datahub Development
	The Digital Product Passport as an Enabler for the Circular Economy Boris Boehme, Director, ICT Technical Regulation, Federal Ministry for Economic Affairs and Climate Action (BMWK)
	Zero Waste and Beyond Arthur Huang, CEO & Founder, Miniwiz
	Designing for a Green Future Vivian Wu, Director of Industry Foresight Section Taiwan Design Research Institute
	Our Purpose in Action: Dell's ESG Strategy Vivian Tai, Lead of Global Product Sustainability Strategy
15:20-15:35 (15 mins)	Panel Discussion
15:35-15:55 (20 mins)	Coffee Break & Networking

TIME	AGENDA
Session 3: Turning Waste to Energy	
15:55-16:45 (Moderator:5 mins) (Speaker:15 mins each)	Moderator: Young Ku, Chair Professor, Department of Chemical Engineering, NTUST
	Energy, Waste and Data-the Future Stephen Sturrock Peters, Senior Energy Specialist (Waste-to-Energy), Energy Advisory Sector Group, Sustainable Development and Climate Change Department, Asian Development Bank
	Circular YFY: Biomass Energy Towards Low-Carbon Transformation Jean Liu, Chairman, Yuen Foong Yu Inc.
	Waste-to-Energy Technology and Achievements in Taiwan Chia-Chi Chang, Senior Researcher, Taiwan Bio-energy Technology Development Association
16:45-17:00 (15 mins)	Panel Discussion
End of Conference	

LOCATION



4F-VIP ROOM, TAIPEI INTERNATIONAL CONVENTION CENTER (TICC)

Close to the World Trade Center 1 and the EU offices in Taiwan, so the transportation is very convenient, and the meeting place is the VIP hall, which can accommodate more than 200 people. The VIP lunch is arranged in the banquet hall on the third floor of the same building, and the rest of the lunch is served in the same place to avoid long distance movement.



VISITS



SITE VISIT EVENT

Time: Tuesday, 30 May 2023 09:00–17:00

Location: Environmental Science and Technology Park, Taoyuan

Visitors: Zhi-Xiu Shen, Deputy Minister of the EPA, representatives from the EU, guests and keynote speakers from overseas and industry representatives from Taiwan and Europe.

Visited Companies: Super Dragon Technology Co., Ltd and Oriental Green Materials Ltd.

TIME	AGENDA
09:00–09:30 (30 mins)	Registration
09:30–10:30 (1 hr)	Transportation(by vehicle)
10:30–11:50 (80 mins)	Site Visit Super Dragon Technology Co., Ltd
11:50–12:10 (20 mins)	Travel
12:10–13:40 (90 mins)	Lunch
13:40–14:00 (20 mins)	Travel
14:00–15:20 (80 mins)	Site Visit Oriental Green Materials Ltd.
15:20–15:25 (5 mins)	Travel
15:25–16:00 (35 mins)	Site Visit Taoyuan Sustainable Resource Center
16:00–17:00 (1 hr)	Transportation(by vehicle)



佳龍科技工程股份有限公司
SUPER DRAGON TECHNOLOGY CO., LTD.

SUPER DRAGON TECHNOLOGY CO., LTD.

Super Dragon offers comprehensive waste treatment and resource circulation solutions for the IT industry. It recycles items including motherboards, monitors, laptops and discarded printers. It uses chemical processing and polishing methods. The PCB boards can be reprocessed into turf blocks, paving stones and marble boards.

Super Dragon's plant at the Environmental Science and Technology Park was built with the support of Miniwiz, a company that specializes in sustainable architecture using solar optic technologies and recycled building materials.



ORIENTAL GREEN MATERIALS LIMITED

With Far Eastern New Century as its parent company, Oriental Green Materials is the first PET bottle recycling company in Taiwan to use its own developed Bottle to Bottle technology. It is the main provider of recycled PET materials in Taiwan, has an annual production capacity of 55,000 to 60,000 tonnes and is able to treat almost 60% of waste PET bottle bales in Taiwan.

The main products of Oriental Green Materials are PET chips and pellets. The recycled bottles go through the process of sorting → washing → label removing → PET crushing and chipping → ultra-high vacuum decontamination → impurity removal using high temperature furnaces → recycled RPET pellets. The carbon emissions from PET bottles made of RPET materials is 60% less than those from fossil materials. We are creating a sustainable closed loop.

Eastern New Century and Oriental Green Materials use RPET materials from recycled PET bottles to make eco-friendly garments and daily commodities. For years, they have been the choice of international sports brands for manufacturing World Football Cup jerseys. Its Bottle to Fiber technology is world-renowned.





2023
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