

In the framework of the upcoming **Global Forum 2022, that will take place on 17 & 18 October 2022, in Muscat, Oman**, a series of preparatory thematic webinars, featuring contributions, reflections and dialogue among key experts and interested stakeholders, are organized.

*This report sums up the discussions of the Global Forum Thematic Webinar VI.*

## Global Forum Thematic Webinar VI

March 16<sup>th</sup>, 2022

### Digitalization in Energy/Water Transition

&

### Circular Economy

#### Participants (53):

Husni Al Abri, Kifah Al Lawati, Ahmed Al Malki, Ingrid Andersson, Sherif Aziz, Youssef Berbash, Silvana Bidirinis, Jean-Pierre Bienaimé, China Blue, Marek Canecky, Mariane Cimino, F. Darakhshan, Donald Davidson, Christian Derler, Walid El Abed, Christoph Glauser, Stéphane Grumbach, Laurent Horvath, Malgorzata Kalinowska-Iszkowska, Sébastien Lévy, Adrien Licha, Suvi Linden, Judy Logan, Giorgos Longinos, Elena Maestri, Catherine Mantel, Jeremy Millard, Désirée Miloshevic, Eikazu Niwano, Marko Petron, Alice Pezard, Laura Prisca Ohler, Giorgio Prister, Judith Ryser, Hilary Sadler, Sankara, Anne-Flore Santucci, Gérald Santucci, Madeleine Scherb, Otto Schwetz, John Erik Setsaas, Susanne Siebald, Jean-François Soupizet, Baïla Sow, Michael Stankosky, Branka Stojanovic, Yoshio Tanaka, Lynn Thiesmeyer, Sylviane Toporkoff, Cid Torquato, Daniel Van Lerberghe, Paul Wormeli, Sarah Zhao.

The Global Forum Thematic Webinar VI on "Digitalization in Energy/Water Transition & Circular Economy" took place on March 16<sup>th</sup>, 2022 from 13:30 to 15:00 Paris time via Zoom.

**This very well-attended invitation-only webinar was a particularly dynamic one touching upon actual societal challenges. About 50 participants from all around the world—all experts of different backgrounds—took the opportunity to share their experience and engaged in lively debates on topics such as sustainable waste management and circular economy.**

It was the sixth of a series of live webinars (the next will be on June 15<sup>th</sup>, 2022) devised for the purpose of feeding the framework of the upcoming Global Forum 2022.

## Agenda

### Welcome and Introduction

#### Topic 1: Digitalization in Energy/ Water Transition

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**Ahmed Al Malki**, Head of Energy Transition Team, Occidental Oman Inc.  
| Energy Management Systems & Energy Digitizing

#### Topic 2: Circular Economy

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**Husni Al Abri**, CEO Smart Way LLC, Oman  
| Circular Economy and Resource Recovery

**Michael Stankosky**, Research Professor George Washington University, USA  
| The Impact of Culture on the Circular Economy

**Jeremy Millard**, Director Third Millennium Governance; Senior Policy Advisor, Danish Technological Institute, Denmark  
| The circular economy and rethinking sustainability

**Paul Wormeli**, Innovation Strategist, Executive Director Emeritus, Integrated Justice Information Systems Institute – IJIS, Wormeli Consulting, USA

### Concluding Remarks

## Welcome and Introduction

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Ingrid Andersson, moderating, together with Sylviane Toporkoff, welcomed the participants to this 6<sup>th</sup> preparatory webinar of the Global Forum 2022.

The moderator briefly addressed the situation in Oman by underlining that Oman is a safe and peace-loving country, with strong diplomatic relations. As a traditional trading point connecting Africa with Asia and Europe, Oman with its strong economic connections is very interesting for international companies.

The agenda of the Global Forum is advancing. The Global Forum is planned to take place on 17 & 18 October 2022, in Muscat—the dates are maintained. The Global Forum has the support of several ministries, such as the Ministry of Transport, Communications and Information Technology as patron of the event, but also the Ministry of Tourism and other actors.

With Covid-19 restrictions gradually lifting, the organisers of the Global Forum hope to welcome as many people as possible in Oman. A hybrid solution will be offered for those who can't travel.

## Topic 1: Digitalization in Energy/Water Transition

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**Ahmed Al Malki**, Head of Energy Transition Team, Occidental Oman Inc., **gave an insight in the standardization of energy management systems and energy digitizing in Oman.**

The energy management system in Oman is accredited to the ISO 50001, which supports organisations to use energy more efficiently through the development of an Energy Management System (EnMS). The EnMS includes the planning and operation of methods to control both energy production and energy consumption in order to provide a structured and comprehensive approach to improve energy efficiency. Even if many companies and organisations have their own energy management system, the ISO 50001 standard serves as a guideline for companies striving to improve energy efficiency.

ISO 50001 adopters can reduce their energy use, greenhouse gas emissions, but also costs for maintenance, man-hours and fuel. ISO 50001 supports the organizations to be compliant with energy efficiency regulations. Besides an improved company image and greater credibility among the stakeholders, certified organisations increase energy awareness among employees and contractors and improve operational efficiencies and maintenance practices.

According to the 2019 report of the International Energy Agency, energy efficiency has a large impact for reducing the global CO<sub>2</sub> emissions. The implementation of an energy efficiency plan to improve energy consumption at a global level would lead to a decrease of 37% of CO<sub>2</sub> emissions—whereas a global increase of renewable energy use would lead to a decrease of 32% of CO<sub>2</sub> emissions. According to this report, 73.2% of the global greenhouse gas emissions originate from energy use in industry, transport or for buildings.

ISO 50001 certification requirements address the entire review cycle of the context of the organization, leadership, planning (incl. energy review), support, operation, performance evaluation, and finally improvement.

The energy review is at the core of the certification process. ISO 50001 requires a documented analysis of energy efficiency, energy use, and energy consumption based on data and other information, leading to the identification of areas of significant energy use and opportunities for energy performance improvement. The objective is to get an estimation of future energy uses and consumption and to identify and prioritise opportunities for improving energy performance.

Another important aspect is the calculation of energy baselines. According to ISO 50001, energy baselines are quantitative references providing a basis for comparison of energy performance. An energy baseline is based on data from a specified period of time. Energy baselines are used to determine energy performance improvement, as a reference before and after, or with and without implementation of energy performance improvement actions.

In order to establish energy baselines, Occidental Oman Inc. has collected data over 3 years. Data are crucial in this context. For instance, in order to improve energy efficiency of gas and oil companies and reduce the loss of gas during the extraction and production process, the companies use data, among others, on daily gas consumption and the amount of water steam used for the extraction. During 3 years, the companies gathered data to find the most efficient relation between gas and steam, and thus water used. This has only been possible through the collection and careful analyse of the relationship between all those data collected.

**Lynn Thiesmeyer** wondered whether there are ways to adapt the energy management system (ISO 50001) to accommodate different environments and climates?

**Ahmed Al Malki** explained that the standard ISO 50001 serves as a guideline to evaluate the energy consumption, be it fuel, oil, gas etc. Following the guideline and the instructions of the standard helps to identify and find relations and especially understanding those data. Then opportunities appear to enhance and minimize energy uses while obtaining a same or even a higher level of production.

## Topic 2: Circular Economy

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**Husni Al Abri**, CEO Smart Way LLC, Oman, **demonstrated the crucial importance of circular economy and resources recovery**—requiring drastic changes in waste management and the adoption of new technologies in order to unleash the potential of reusing and reducing waste worldwide.

The need to recycle and reuse waste is a global issue and has to be embraced globally. International collaborations aim at reducing carbon footprints and implementing the latest waste management and recycling technologies. Waste (and thus resources) recovery is of critical importance as waste generation significantly increases at the global level. However, there exist large discrepancies between the waste generation of different countries and continents—the U.S. being in first place, with almost twice as much waste as Europe, which is in second place.

The digital sector creates a lot of e-waste, i.e., discarded electrical or electronic equipment, and countries have to collaborate and use high technologies to tackle this issue.

The Oman waste management system is regulated by an environmental authority. The operational part is carried out by a company called Be'ah. Be'ah is in charge of solid waste management of both hazardous and non-hazardous waste. Be'ah is moving towards sustainable waste management practices according to international standards by creating the necessary infrastructure, restructuring municipal waste collection services and improving public awareness of waste management. These efforts are supported by the Sultanate of Oman, which plans to introduce latest waste management technologies.

Thanks to investments in waste segregation enabling waste reduction at source, reuse and repair, recycling and composting, Oman is trying to move from waste-only disposal in landfills to waste reduction and recycling. This also requires collaboration between industry and academia in order to find suitable digital solutions and connect all stakeholders involved.

The Sultanate of Oman is investing in waste recycling and the reduction of waste production within the country. Implementing waste segregation requires digital solutions to identify the waste. There are many companies that work as subcontractors for the government in the field of waste transport and collection. Identifying and transporting the type of waste that can be recycled and reused is key and requires latest digitalization systems.

Plastic waste is one of the issues of waste management that has to be addressed at a global level. Out of the 420,000 million tonnes of post-consumer plastic waste being generated in Oman, only 4% is currently recycled and 85% is dumped in landfills. Compared to the European average of 15% recycling rate, Oman has an opportunity to recycle a further 40,000 million tonnes of plastic waste. This can add substantial value to Oman's economy in terms of value retention and value creation, job growth, economic diversification as well as environmental protection. The Sultanate of Oman is aiming at transforming old waste into new products like using/recycling PET plastics for new products or 3D printing. Recycling PET plastics generates a new value chain as PET is one of the few polymers that can be recycled into the same form over and over again generating a closed-loop recycling solution.

**Gérald Santucci** underlined that technology is the enabler for recycling, in particular the IoT can enable systemic change, from redesign of products and supply chains, to changing business models. IoT provides the data- and feedback-rich systems that allow circular designs and business models to thrive. In fact, we are talking here of ‘smart management of assets’. The presentation showed that we are moving to a complete system reinvention.

**Lynn Thiesmeyer** gave the example of Japan: Japan has a long-standing example of ‘Eco-Village’ and ‘Eco-Town’ of which the city of Minamata is the best-known example. Minamata was the first globally known victim site of industrial pollution, and now has Zero Waste in all sectors. What is interesting is that they do it in a hybrid manner, not only with digitization. Of course, there was some very high and expensive technology involved, but it also depended heavily on involvement of the population, the human involvement—the behaviour and also cultural values being shaped towards elimination of waste that people felt a stronger sense of responsibility to ensure success. However, Minamata is a small city and it is not sure that the solution there can be used in other larger cities.

**Michael Stankosky**, Research Professor George Washington University, USA, **elaborated on the impact of culture on the circular economy.**

At the time, the quality movement was based on the idea that quality has to be designed in from the beginning. This is part of the problem of the circular economy: it has to be designed in—in every area, from agriculture to manufacturing and even to government. We have to figure out how to design it in, and this has to start with the academics and the experiences we have.

There is also a lot of new legislation, the so-called ‘right to repair’. This right to repair is another very important aspect.

Take for instance the example of wireless earbuds: Introduced in 2014, by 2026 nearly all 750 million wireless earbuds, given their lifespan of two to five years, will be defunct and there is no possibility to repair them. This left-over mass of plastic, cooper, circuit boards, magnets, and batteries will join the trove of e-waste. And this is just one case of a very small, but essential digital item in today’s economy. Imagine all the other sectors, such as computers, smart phones, autos, appliances, and household gadgets.

The concept of design in circular economy solutions and the right to repair have to go hand in hand. And more and more industries will adopt this, because the cost and the scarcity of resources requires new solutions.

The Swappie Corporation in Helsinki, Finland, for instance, uses a holistic approach on refurbishing used phones. To overcome peoples’ mistrust over quality of refurbishers, they handle every step in-house, from receiving the used phone to diagnosing and repairing them to sending them out and marketing them through traditional advertising and a well targeted influencer campaign. Revenues went from half a million Euros in its first year to 98 million by second year.

We have to move from linear [take – make – waste] to circular [make new again]. But again, we have to design it in. The design process is a critical aspect, and often we don’t take advantage of it.

**Jeremy Millard**, Director Third Millennium Governance; Senior Policy Advisor, Danish Technological Institute, Denmark, **discussed circular economy and rethinking sustainability**.

Changing the name of a local ‘waste collection center’ into ‘value park’ can lead to a change of mindset. Waste still remains waste, but people look at it differently and start thinking about it in a new way: Waste becomes something that can be used in other industrial processes. Thus, linking between different industrial processes is key.

The idea of circular economy is to maximise and retain the value of materials circulating in the economy. This involves minimising waste as much as possible—however, if you have waste, it is a loss of value.

There are two basic types of technology in the circular economy: the technology for manufacturing and processing, and the interconnectivity technologies (ICT, transport, distribution, logistics, etc.)—with the latter one being even more important in this context.

When looking at digital technologies in the circular economy, the idea is to retain value of a material both end-to-end (along the whole value chain) but also with regards to life-cycle information. How to ensure that the life-cycle is extended by making sure that a specific material is used efficiently and reused?

The Butterfly model (Kate Raworth, Doughnut Economics, 2017) shows the two aspects of the circulate economy: The regeneration of biological nutrients (biomass and organic materials) where we capture value at each stage of decomposition (which is very important in the food sector). As well as the traditional approach of restoring (repairing, reusing, refurbishing, recycling) materials. The idea is to move away from the traditional linear process of “take, make, use, discard” to the circular process of “make, remake, reuse” as much as possible.

The pyramid model is a very similar model showing that maximising circularity leads to maximised value retention – going up the efficiency hierarchy of recovering, recycling, reusing, reducing, and regenerating.

Rethinking industries both from the bottom and from the top means rethinking these issues where digital technologies and interoperability enable information to travel with a product. And then, developing real-time documentation, such as ‘materials passports’ to increase trust. Also, more local and shorter value chains with local knowledge and proximity can be very important within a given industry, but also between symbiotic industries. In conceptual terms it is often the smaller enterprises, but at the moment the frontrunners are global multi-nationals, such as Unilever. They control a wide range of industrial production and materials and thus can easily see where the waste of one industry can be used in another industry.

The French SmartNoshWaste project is an example of regenerative circular economy: a blockchain based multi-layered framework utilizing cloud computing, QR code, iterative learning to reduce food waste. One can see that the volume and the type of different data sections required is increasing across the whole value chain.

The construction sector is one of the most damaging sectors in terms of climate change, but also one of the most challenging in reusing materials. Most examples of such restorative circular economy are local or city-based as it requires interlinking all the different players within a city in terms of the construction sector. Baubüro in Zürich has set up a sort of exchange platform, also ensuring the physical storage in order to reduce the idle time of material—as idle also corresponds to a sort of waste adding to the cost. They have managed

to cut CO2 emissions by half, compared to the huge effort needed to shave a few percent off the carbon footprint of a standard construction project. They also insist that using a circular economy approach must have the same or lower costs than a conventional approach.

Circular economy is a central part of rethinking sustainability in terms of balancing efficiency against resilience in this new age of shocks and crises. We face a de-globalising world, an on-going climate crisis, the financial crash in 2007/08, the pandemic in 2020, and now the crisis in Ukraine. According to the WEF, all this is pushing towards the ‘great de-coupling’. Circular economy has an important part to play in the resetting of our economies in this context. We are seeing shorter value chains, on-shoring and ‘new local’ partnerships (but no independent isolation). The EU has a ‘strategic autonomy’ policy trying to be self-sufficient with regards to strategic goods and services. We have to reconsider the mantra of ‘leanness’ as efficiency and move from ‘just-in-time’ to ‘just-in-case’.

Circular economy meets the requirement of maximising sustainability by balancing efficiency to reduce waste and resilience through diversity and interconnectivity (both proximity and digital).

**Laurent Horvath** addressed the difficulty of data sharing and getting access to data. How to manage data sharing with partners outside your own organisation?

**Jeremy Millard** underlined the importance of standardisation in terms of data formats and interoperability, but also of security. In many cases, this takes place at an industry level. IoT and blockchain may be ways to address these issues.

**Walid El Abed** emphasised [via chat] that data belongs to the source and this ownership has to be respected. What people should share are goals and values, and their data must follow and must be aligned with the policies and values of the community. Sharing data means sharing assets.

**Daniel Van Lerberghe** [via chat] pointed to the difference between private data of individuals and public data that are more useful.

**Gérald Santucci** agreed [via chat] that businesses have an interest to share private data in the digital economy. It’s a matter of survival and thriving. Personal data is something different. However, what is ‘personal’? If one pushes the logic to its extremity, almost everything is personal data, hence subject to, for instance, GDPR. Haven’t we to rethink what ‘privacy’ is? Especially if we want to find a common view between countries across the world.

**Daniel Van Lerberghe** [via chat] agreed that we need to reinvent harvesting data in light of GDPR restrictions in order to maximise the potential of private and public data.

**Gérald Santucci** wondered [via chat] whether we should open the concept of ‘open data’ to private data—not just private data, as we do in Europe. Private can be re-used in its own way, e.g., to support the circular economy!

**Désirée Miloshevic** added [via chat] that there is a new way of thinking for opening up some personal data that could be useful for the circular economy and other. And that is via setting up appropriate solutions for collective data.

**Sherif Aziz** pointed out that not all issues of the circular economy can be solved digitally. There are certain aspects without a digital solution that we have to address. For instance, the question whether we should continue with the same kind of consumption pattern—leading to a steadily increasing consumption?



**Gérald Santucci** added [via chat] that the circular approach is also a way to allow businesses to increase profits: extracting additional value from existing assets by maximizing their re-use; creating new value from materials currently discarded as waste; cutting costs of manufacturing (remanufacturing used products to like-new condition takes much less energy and emissions than making entirely new products; reducing exposure to volatile supply of primary raw materials; and offering innovative business models (e.g., Product-as-a-Service, sharing economy). In fact, businesses are facing an ‘existential’ shift - considering waste no longer as a cost but as an investment to create wealth in the sustainability-driven economy.

**Stéphane Grumbach** commented [via chat] that the question of resilience and diversity is fundamental argument pushed in "[How humans may co-exist with Earth? The case for suboptimal systems](#)" commented [via chat]

**Désirée Miloshevic** added [via chat] that open-source technologies and communities may help reengineer our societies.

**Paul Wormeli**, Innovation Strategist, Executive Director Emeritus, Integrated Justice Information Systems Institute – IJIS, Wormeli Consulting, USA, **commented on the question of how to ensure interoperability.**

For interoperability to become a reality, you need to make the business case for it. Organisations don’t just decide to make things interoperable because it is possible, but they look for why it is important to do.

There are plenty of business cases to make in the circular economy for why interoperability is important. We need research about that, we need more people studying how to make this business case, and then there is this ingredient that makes it happen: the standards about interoperability. Standards bodies need to be energized in response to those use cases and business cases that argue for why interoperability is important in building a circular economy.

Let us think more about taking a lifecycle holistic systems approach to the use of materials. That idea of carrying metadata with materials in various details as they become reenergized for different purposes—this is at the heart of how interoperability has to operate.

If we would spend some more time on studying those business cases, we would make a lot of successful moves towards providing this interoperability.

**Daniel Van Lerberghe** wondered how to adopt some principles of the local economy in the urban culture which is starting to take up in many cities.

**Jeremy Millard** answered that the ‘city region food systems’ approach is really important—this idea that a city should try to provide most of its basic food in a certain radius. It is about putting digital into agriculture with precision farming, but also urban farming, hydroponics and aquaponics, where people can start on a very commercial basis. This is happening in many places, e.g., in basements, on top of roofs of big buildings etc. It is all based on circular economy principles. People will get used to much more seasonal and local food. These things are very powerful and are building up community effects.

**Marek Canecky** [via chat] pointed to a concept of European Data Spaces being developed by the European Commission that tackles the issue of data and the interoperability of data including circular economy data.

## Concluding Remarks

Sylviane Toporkoff, together with Ingrid Andersson, thanked the speakers and participants for this very interesting session. Today's webinar touched upon important societal challenges and was enlightening on various aspects. This is what the Global Forum 2022 in Oman will be about: it will address the societal challenges and how digitalisation and digital technologies can support those societal challenges.

The Global Forum is a community of people who are thinking about and discussing the same issues by bringing in different perspectives and backgrounds. That is so important. It is with ideas that we move forward!

The moderator reminded the **upcoming Global Forum Thematic Webinar VII on 15<sup>th</sup> June, 2022.**

Timing of the webinar: 1:30 pm to 3:00 pm Paris time / 7:30 am to 9:00 am Washington DC time / 9:30 pm to 11:00 pm Tokyo time.