

## Session Report of Parallel Session 2: Circular Economy

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In Parallel Session 2, we invited four speakers from two institutes to discuss the state-of-the-art research and practice in the field of circular economy (CE).

In the first part, each speaker presented their research interests and views on CE. The first speaker, Prof Stephen Evans, shared the landscape of CE research over the last 10 years, in which he mentioned both opportunities and challenges. While many researchers are nowadays work on CE and new research topics are emerging, we still struggle to develop frameworks of CE and face difficulties to test and implement a CE in a real world. The second speaker, Dr Takanari Ouchi, pointed out that recycling can save energy and reduce CO<sub>2</sub> emissions and, therefore, the invention of new metal smelting technologies is required towards achieving carbon neutrality. He presented novel recycling processes of precious metals and rare metals, with a particular focus on gold. The third speaker, Dr Anna Barford, focused on social and human aspects of CE with a case of plastics circularity. She provided the comparison of informal waste collection in some countries, e.g., Brazil, Indonesia, and South Africa, in terms of working conditions and challenges, followed by discussing decent work in CE. The fourth speaker, Dr Yuko Oshita, presented a 'co-junkan' platform as an approach to foster the full use of regional stock and resources towards sustainability. She shared social implementation trials in a Japanese island focusing on, e.g., energy systems with locally-produced biomass. She emphasised the importance of filling knowledge gaps between researchers and stakeholders, for which co-learning using workshops is useful.

In the second part, we held a discussion session between the speakers and the audience, through which two keywords were raised - *diversity* and *implementation*. First, we confirmed the *diversity* of CE research based on the topics presented by the four speakers, which included business models, recycling technologies, decent work, and energy systems, covering both technological and social/human aspects. This shows that CE could be an umbrella term. It is indeed crucial to understand CE from multi-faceted views because examining only one aspect (e.g., technology) is not enough. Second, we agreed that *implementation* is very challenging because achieving a CE entails system-level changes in society over time. In addition, when assuming the implementation phase, specific situations that differ according to the country or region of interest need to be considered.

As summarised above, enablers, opportunities, and challenges for CE were broadly discussed. As time was limited, we expect to continue discussions on the topics raised during the session and on how further collaboration can be accelerated between two institutes.