Global Review of Innovation

International Innovation Management

Module: **ACPA 7003**

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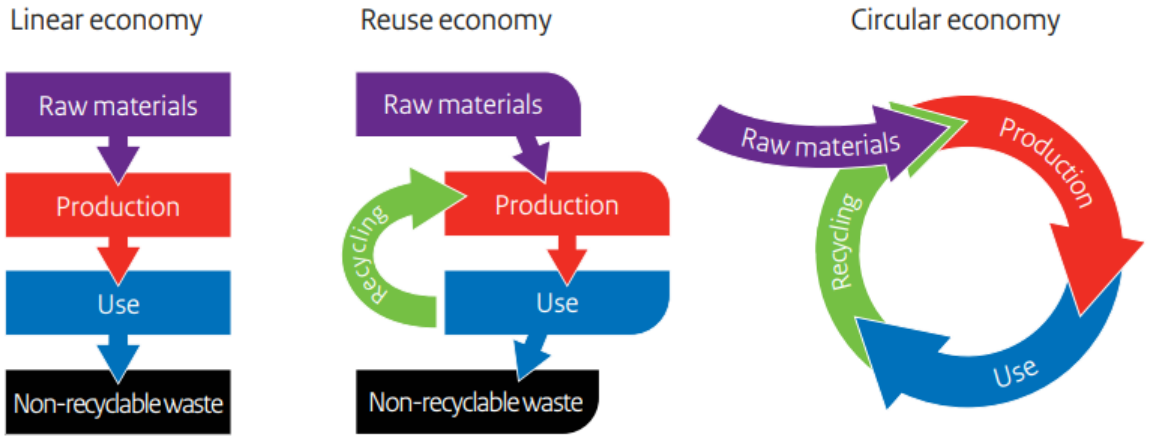
Focus and Intent of Presentation

- Circular economy (CE) – Global review
- Common themes
- Specific attention on:
  - Culture
  - Politics
  - Community
  - Education

(Craig)

Circular Economy Background



- Currently, just 8.6% of the world's economy is circular, which means around 91 billion tonnes of material each year is being left to its fate in the natural environment through a linear and reuse 'take-make-waste' models.

- Research conducted by SAP alongside the World Economic Forum shows that 61% of the world's population (4.9 billion people) lacks access to infrastructure around waste management or recycling.

- Stephen Jamieson – Global Head of Circular Economy Solutions at SAP – "Shifting to a circular economy means a change in how we design not only products and new materials to eliminate waste, but also new policies, infrastructure and business ecosystems."

(Ashcroft, 2022)

(Craig)

Circular Economy Strategy

Mostly due to it's infancy there are limited resources around business models on circular economy, therefore countries and regions with it high on the agenda are committing significant resource to supporting business at a strategic level, and providing specific business support with be given to businesses related to business models and growth strategy (Ashcroft, 2022).

Whilst far from exhaustive this list outlines some key focus points that will help businesses steer towards more circular operations:

- Eliminating waste to prevent destruction of nature.
- Circulating materials and products to keep them in use as long as possible.
- Having end-to-end insight to drive regenerative business, so decisions made by consumers link all the way through to ultimate land-use impact.
- Educating designers in the intricacies of each value stream is near impossible, each value stream must be in a position to provide a feedback loop into the design process which fall in-line with their strategic moves toward a circular economy.

(Galer, 2022)

(Ryan)

Common Themes

- Roadmaps - GOALS
- Lifecycle assessments
- Sustainability impact assessment – notes required
- Redesign
- Collaboration – Coca cola + Dow Chemical (Coca-Cola, 2021, Dow, 2021)
- Strong Leadership
- Stakeholder engagement
- Funding

(Ryan)

Political

- Joint Ventures/Collaborations
- Funding
- Regulation/Monitoring
- Incentives

"Circular economy does not happen spontaneously by relies on policies that support experimentation and innovation" (CSIRO, 2021)

(Ryan)

Political – Joint Ventures/Collaboration

- EU – India has also established a strategic partnership with India through a joint declaration (EU-India 2020) in the field of resource efficiency and CE adoption to collectively work towards achieving environmental and economic ambition of the Green Deal and Paris Climate agreement.
- EU - Innovators and policymakers collaborate to identify circular solutions – EV Batteries and legal framework (EllenMacarthurFoundation2, 2021)

Political – Funding

- European Commission approved a EUR 1 billion grant from to support German company Salzgitter Flachstahl's decarbonisation of its steel production - Hydrogen (EuropeanCommission, 2022)
- Australia -$70 billion in grants, incentives and funding pools to Australian-based companies across priority sectors (GlobalAustralia.gov, 2022)
- America - Biden awards $2.8 billion in grants for EV battery manufacturing

(Ryan)

Political – Regulation

- India - formulated policies such as plastic, e-waste and construction waste management rules, and metals recycling under the umbrella of ABA (InvestIndia, 2020)
- EU
  - Introducing rules = pharmaceutical/cosmetic companies pay to clean up wastewater (Euronews, 2022)
  - C-type chargers only – save consumer money and vital resources (EuropeanParliment, 2022)
- Lithuania - Bans import of waste for incineration. Lacks circular incentives (Tax etc) (Dagiliene et al, 2021)
- UK - CE marks (TheGurdian, 2022)
- France
  - Anti-waste and Circular Economy Law Policy measures that are a world first (EllenMacarthurFoundation, 2022)
  - Ban the destruction of unsold non-food products

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Political – Incentives/Stimulation

- The Australian Government is increasing its purchase of products with recycled content to generate demand for recycled materials.
- CSIRO - Australia's national science agency and innovation catalyst, collaborating to boost Australia's innovation performance – Sets out **Circular Roadmap** (CSIRO, 2021)
- Sweden refund system on cans and bottles (Aagaard, 2019)
- EU - Innovation Deals were identified as a mechanism to stimulate innovation and support the transition
- India - ABA - Coal Gasification / Liquefication will be incentivised through rebate in revenue share (InvestIndia, 2020)

(Craig)

Starting in the Community

In 2010, Brazil produced an estimated 12 million tonnes of plastic. It's the fourth biggest producer in the world behind China, the US and Germany. At the same time, a study found 7.2% of the plastic waste in Latin America and the Caribbean was "mismanaged" – either being littered or disposed of inadequately, meaning it was more likely to wind up in the ocean (Raja, 2022).

Brazilian materials engineer, Guilherme Brammer, was so frustrated by the lack of adequate recycling he saw in his home city, São Paulo, that in 2011 he created Boomera to find new ways to revive the value in, and reuse, the hard-to-recycle waste products that usually end up in landfill, such as disposable diapers, cigarette butts and coffee pods. The result is post-consumer recycled material (PCR) (Raja, 2022).

The project to re-use diapers scaled from a sanitary laboratory project, where the Boomera team developed a process of separating the unsanitary waste from the re-usable materials on molecular level, to an industrial operation where those discarded resources are inserted back into the production cycle, to re-use over 10-tonnes disposed diapers each month (Boomera , 2022(1)) .

(Craig)

A Series of Small Changes

Change does not just have to be on an industrial level. Smaller entrepreneurial movements can be effective as their principles can thrive in the community, and start a small domestic change with the potential to expand quickly and changes lives on a large scale.

In addition to reducing production costs and losses, companies that choose to use the circular economy depend less on virgin raw materials and prioritize the use of raw materials from the recycling process, as well as more durable, recyclable and renewable inputs in production processes.

Brammer created a revolutionary circular economy business that brought together industry, academia and environmental agents, while involving research and development, product design and reverse logistics which has found solutions for many big companies, including Procter & Gamble, Adidas and Nestlé (Boomera , 2022(2)).

How can we inspire change on a local or domestic level with the ability to scale up as momentum grows? As awareness of circular economy grows it may be apparent that we are already recycling more waste than we realise.

(Ryan)

Culture

- Corporate cultures - common norms and values on the organizational level (Deshpandé & Webster Jr, 1989)
- National culture
  - Patterned ways of thinking, feeling and reacting and their linked values" (Kluckhohn, 1951, 86) among members of one culture
  - Members of a culture generally act, regardless of whether the setting is professional, social, or private.
- The transition toward a circular economy requires a change in corporate culture (Salvioni and Almici, 2020)
- Firms can influence their culture (long process) but national culture = circumstance that cannot be changed (Hofstede, 1994)

(Ryan)

Culture - National Examples

- Chinese innovation system is organized and much more centralized + strong top-down planning coordination
- German innovation system = decentralized with a different power structure on the national, Federal State and regional level
- Australia - scores low on the proportion of businesses collaborating with universities, sitting at the bottom when compared to other OECD nations
- EU citizens call for tougher regulations on air pollution = EU to enforce tougher limits on toxic air pollution (Euronews, 2022)
- Sweden - Deposit Return Scheme (ZeroWasteScotland, 2022)

(Ryan)

Cultural – Business Examples

- Returpack
  - Sweden's deposit return system - challenge – changing consumer behaviour
  - Highest return rates globally (ZeroWasteScotland, 2022)
- Walmart - Customers were a tad bit freaked out by Walmart greeters and their propensity to bag customers groceries for them, both unusual practices in Germany (Firmex, 2022)
- Ikea and Home depot – (CNBC, 2019)
- Starbucks (CNBC1, 2018)

(Ryan)

Business Models

- The CE requires new business models and scientific innovations on which new businesses and markets can be based (Leising et al, 2018)
- Philips
  - Introducing new business models to support this, such as product-as-a-service, take-back schemes, and upgrade and refurbishment programmes (Phillips, 2022)
  - 2018 World Economic Forum, Philips = Take back and repurpose all large medical systems that our customers were prepared to return to us by 2020
- Interface flooring (TheGuardian, 2011)
  - Under its ReEntry 2.0 scheme, InterfaceFLOR helps customers reduce their impact on the environment by taking back carpets that have reached the end of their life and either re-using or recycling them
- Allbirds
  - (DTC) (FourWeekMBA, 2022)
  - BCORP (Allbirds, 2022)

(Ryan)

Common Tenets of Circular Economy

- Commonly used CE tenets and their explanation – (Nudurupati *et al, 2022)*
  - Reduce
  - Reuse
  - Recover
  - Recycle Converting or reprocessing
  - Redesign

- Sustainability-oriented innovation (SOI) (Adams et al, 2016) - Requires big changes

(Craig)

Reverse Logistics

Reverse logistics aims to close the loop between the consumer and the input of materials back into ‘industry’ or the manufacturing process.

Collaboration is particularly important to address supply chain challenges and reach pragmatic solutions (Yamaguchi, 2022)

Consider that wide scale transportation of good contributes to up to 25% of total carbon emissions (IFT, 2016)

It’s no surprise that reducing wasteful logistics is high on the circular economy agenda. However, the challenge seems to be capturing and transporting suitable waste product to re-insert into industry.

(Craig)

Reverse Logistics

Defeating the object

- Commonly mass mixed waste is sorted through and re-distributed to suitable industries via various mediums of heavy transport.
- In an effort support circular economy the ‘collection and selection’ process is still contributing heavily to carbon emission

What are the Alternatives?

- Companies offering end-to-end logistics management solutions, for example, digitally optimise deliveries by finding the most suitable logistic partners in real time (Dutton, 2022).
- For instance, working with large multi-national brands, Helsinki-based ‘OGOship’ uses live data and digital mapping to ensure products with complex supply chains are shipped across Scandinavia to suitable plant, without disruption (Dutton, 2022).

(Craig)

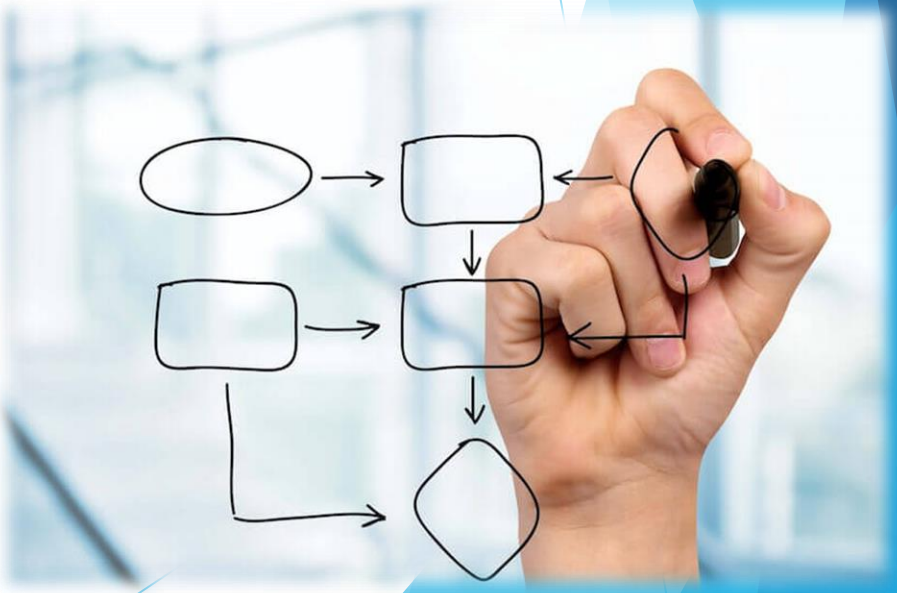
Back to the Drawing Board

Remove the waste sorting process all together

- Design the product for a circular economy
- Take way the need re-sort recycled waste at the design phase
- Use subscription based or other incentivised business models which encourage the consumer to return the goods to the manufacturer

The order of priority

- Re-use
- Up-cycle
- Only in the worst case re-cycle



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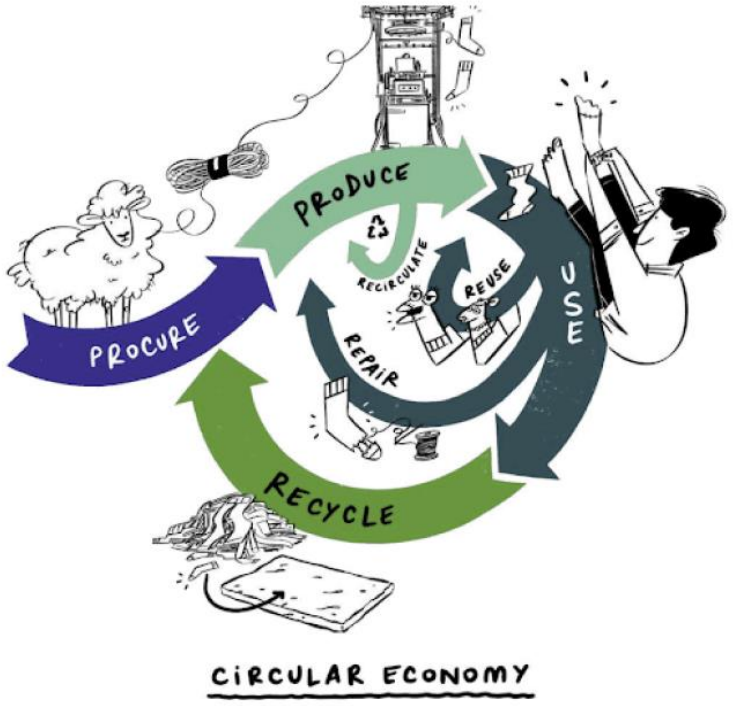
India

- CE adoption in India will help to reduce the greenhouse gases (GHGs) emissions by 44%
- Specific focus on construction due to growing population
- Result in economic benefit of approximately 624 billion dollars (Ellen MacArthur Foundation, 2016
- Responding to this challenge, a global research initiative called the LC^3-Project, which includes institutions like IIT Madras, IIT Delhi, TARA (Development Alternatives) New Delhi, UCLV (Central University “Marta Abreu” of Las Vilas) in Cuba and EPFL (Swiss Federal Institute of Technology Lausanne) in Switzerland, have explored a possible solution

(Ryan)

Chile

- Roadmap - 100 stakeholders from the public and private sectors, NGOs, academia, and citizens
- 27 initiatives grouped into four pillars/groups (Ellenmacarthurfoundation1, 2022)
  - **Circular innovation**
  - **Circular culture**
  - **Circular regulation**
  - **Circular territories**



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Australia

- Australia's waste sector is undergoing a seismic shift. We're improving resource recovery, increasing the use of recycled material and better managing waste material flows and transitioning to renewable energy sources.
- National Waste Policy Action Plan - Modernise and transform waste management (GlobalAustralia.gov, 2022)
- Banned export of waste – Creates an opportunity for a new circular economy strategy that turns landfill into economic returns (CSIRO, 2021)

(Craig)

Amsterdam

There is stark comparison between two of words biggest fossil fuel ports. The port of Newcastle and the port of Amsterdam are two of the most renowned fossil fuel ports in the world. The port of Newcastle is one of the biggest coal ports and serves as a gateway to western Australia (The University of Sydney, 2022).

Similarly the port of Amsterdam is one of biggest petroleum ports in the world and serves in many ways as a gateway to continental Europe. This is where the similarities end.

The port of Newcastle have so far failed to embrace a circular strategy and a move toward sustainable operations is a far cry from the efforts made by their European counterparts in Amsterdam. In their 2016 Annual Report, the Port of Amsterdam announced their goal to allocate 25 hectares of port land to the circular economy by 2020 (Port of Amsterdam, 2016).

In The Port of Amsterdam, whilst they made extensive strides to increase the number of circular activities in the precinct, the major challenge was scarcity of port space. Therefore, they are maximising the available space by considering where to place new activities around existing activities and how they will intrinsically link with one another for greater impact (Port of Amsterdam, 2020).

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Creating Space for Innovation

The efforts in Amsterdam have created an innovative space with healthy competition and a common goal. This is attracting some of the best and brightest minds from around the globe, setting them on a journey to develop solutions for sustainable bio-fuels, along with a number of other critical supply chain and logistics challenges facing the industry.

In its current state, the Port of Newcastle has ample space to build, but minimal circular activities, giving it what the Port of Amsterdam does not have - A 'clean slate'. To maximise productive use of port space, the Port of Newcastle should carefully plan industrial synergies, logistics, and transport as it builds a circular port ecosystem (The University of Sydney, 2022).

If offered a clean slate, could we as an organisation leverage the momentum that has already been generated in these pockets of innovative space?
We could place ourselves in a position to grow and collaborate with real changemakers.

(Craig)

Academic Partnerships

in partnership with

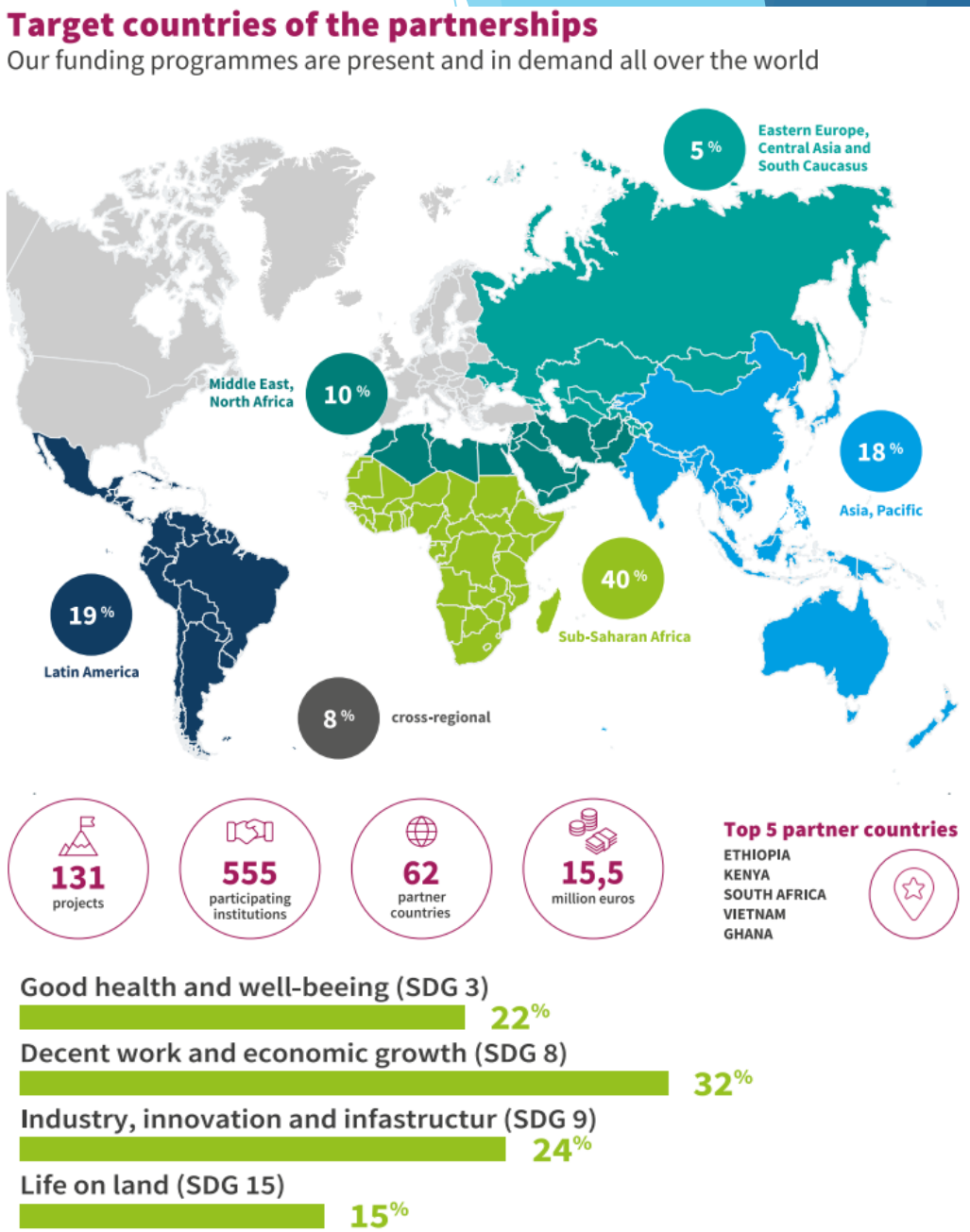
BRITISH COUNCIL

The Association of Commonwealth Universities

In 2018, the International Association of Universities (IAU)23 launched the IAU Higher Education and Research for Sustainable Development (HESD) Cluster.

This initiative aims to promote the role of higher education institutions in building more sustainable societies. The Cluster brings together member universities to work collaboratively on developing existing, and designing new initiatives, aimed at addressing Sustainable Development Goals.

Each group on the Cluster brings together universities that have expertise on the relevant goals. The collaboration encourages a holistic approach, embedding sustainable development, strategic planning, in both academic and organisational institutions.



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Academic Partnerships

There is clear evidence that this form of international partnership delivers added value. The variety of institutions mobilise diverse resources and complement each other's expertise. This in turn provides more opportunities for mutual learning, networking, and an open transfer of knowledge.

Working together also helps reduce financial and project management risks, as well as increase the prospects of future funding.

Partnerships also facilitate collaboration between different organisations, as higher education institutions are able to bring different types of partners, such as public sector and non-profit organisations, as well as private companies, and multi-nationals.

As a growing organisation how can we leverage academic networks to build foundations in less developed countries?
This could offer cost benefits in manufacturing and the opportunity to contribute to the developing world.

(Ryan)

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