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Circular ecosystem design

Accelerating circular economy transitions and behaviour change

Regional Circular Economy Summit
Bass Coast Shire – Berninneit, Thursday, June 5, 2025
A/Prof Martin Geissdoerfer



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Acknowledgement of Country

We acknowledge the Traditional Custodians of Country throughout Australia and their continuing connection to land, skies, waters, and community. We pay our respects to their cultures and their Elders past, present and emerging.

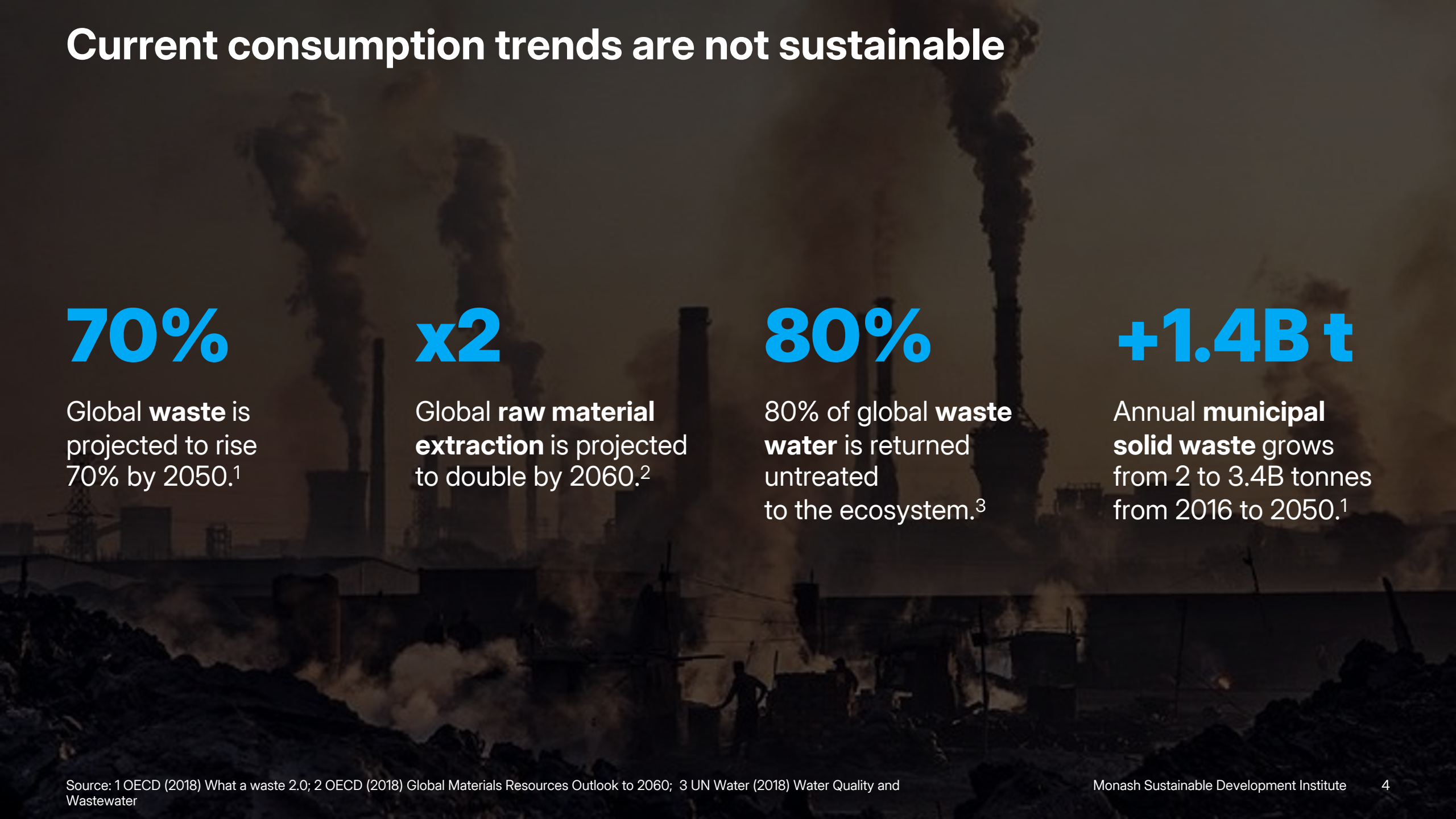
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Current consumption trends are not sustainable



70%

Global **waste** is projected to rise 70% by 2050.[1]

x2

Global **raw material extraction** is projected to double by 2060.[2]

80%

80% of global **waste water** is returned untreated to the ecosystem.[3]

+1.4B t

Annual **municipal solid waste** grows from 2 to 3.4B tonnes from 2016 to 2050.[1]

Source: 1 OECD (2018) What a waste 2.0; 2 OECD (2018) Global Materials Resources Outlook to 2060; 3 UN Water (2018) Water Quality and Wastewater

The Circular Economy can be a key part of the solution



39%

Adopting circular economy principles can **reduce global greenhouse gas emissions** by 39% by 2050[1],

32%

cut primary material consumption by 32% by 2030[2],

$ 4.5T

unlock up to $4.5 trillion in **additional economic output** by 2030[3], and

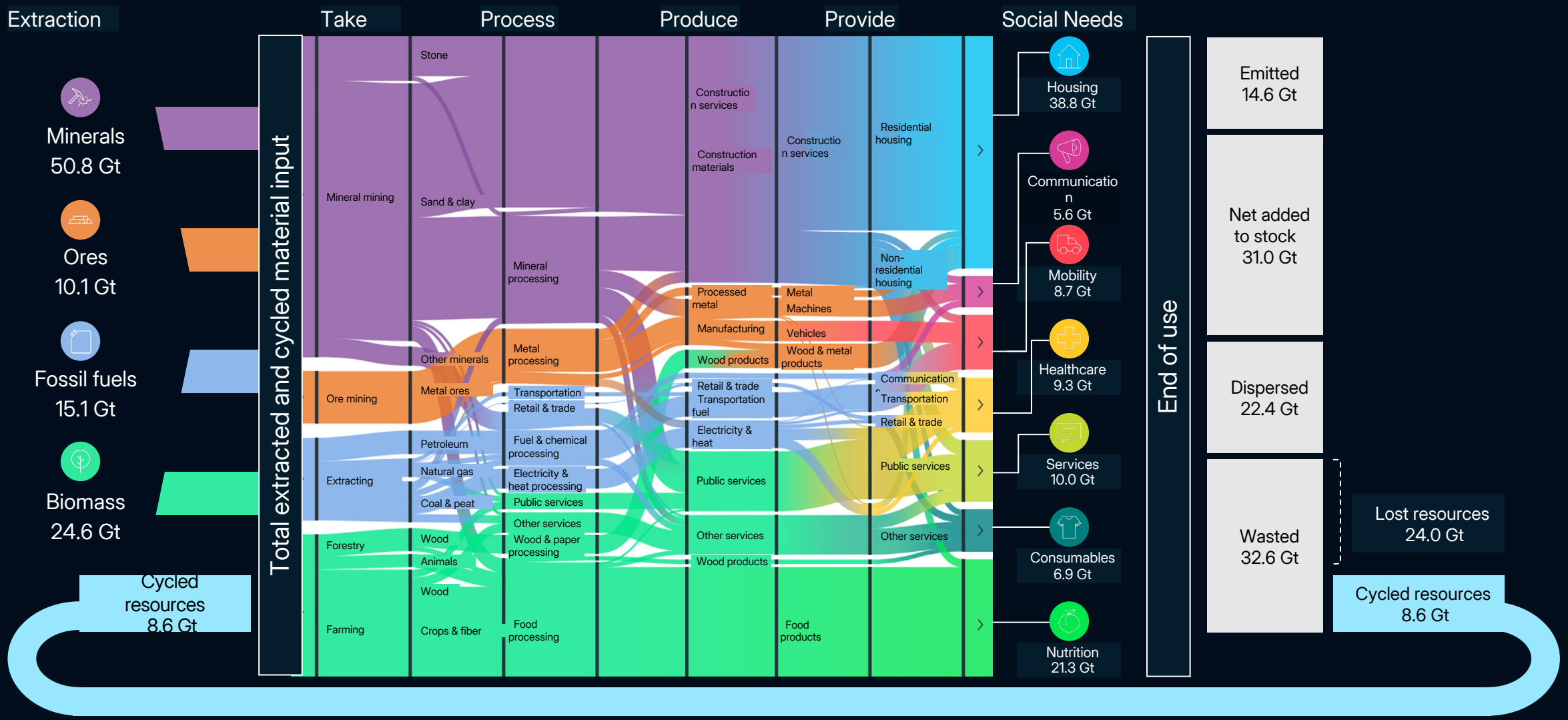
6M

create additional jobs for 6 million people.[4]

Source: 1 Circle Economy (2021) Circularity Gap report 2021; 2 Ellen MacArthur Foundation ; 3 Lacy and Rutqvis (2015) Waste to Wealth; 3 UNEP (2021) Policy Options To Eliminate Additional Marine Plastic Litter; 4 International Labour Organization (2018) World Employment and Social Outlook 2018

But the Circular Economy is currently still in its infancy

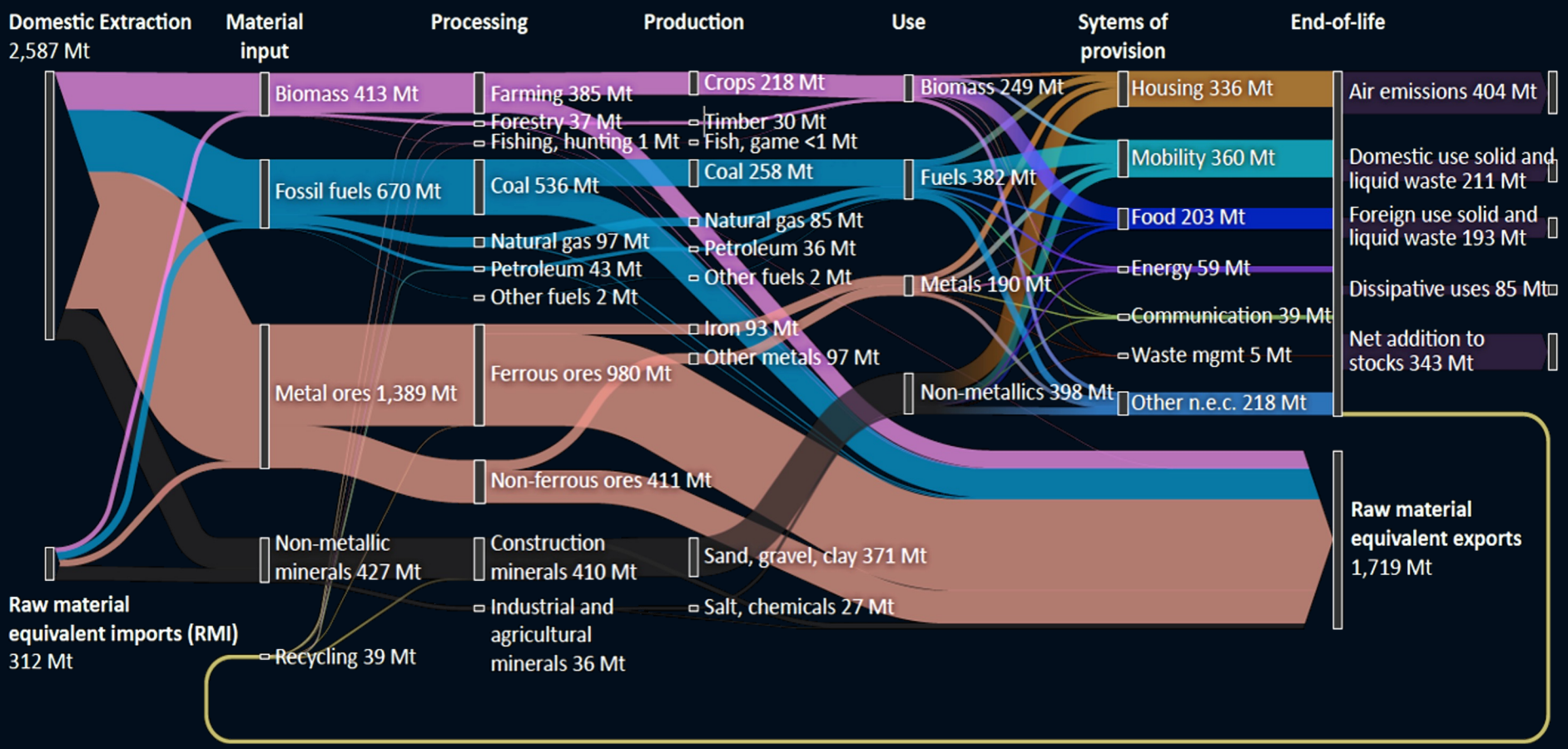
Globally we only cycle 8.6% of what we use, which leaves a massive circularity gap of over 90%



Source: Circular Gap Report, 2020 numbers

...and Australia is only just embarking on the journey

In Australia we only cycle ~4% of what we use, with a massive material footprint



Australia's material footprint

2,587 Mt

material extraction in 2019, of which 917 Mt were consumed domestically, and only 39 Mt recycled

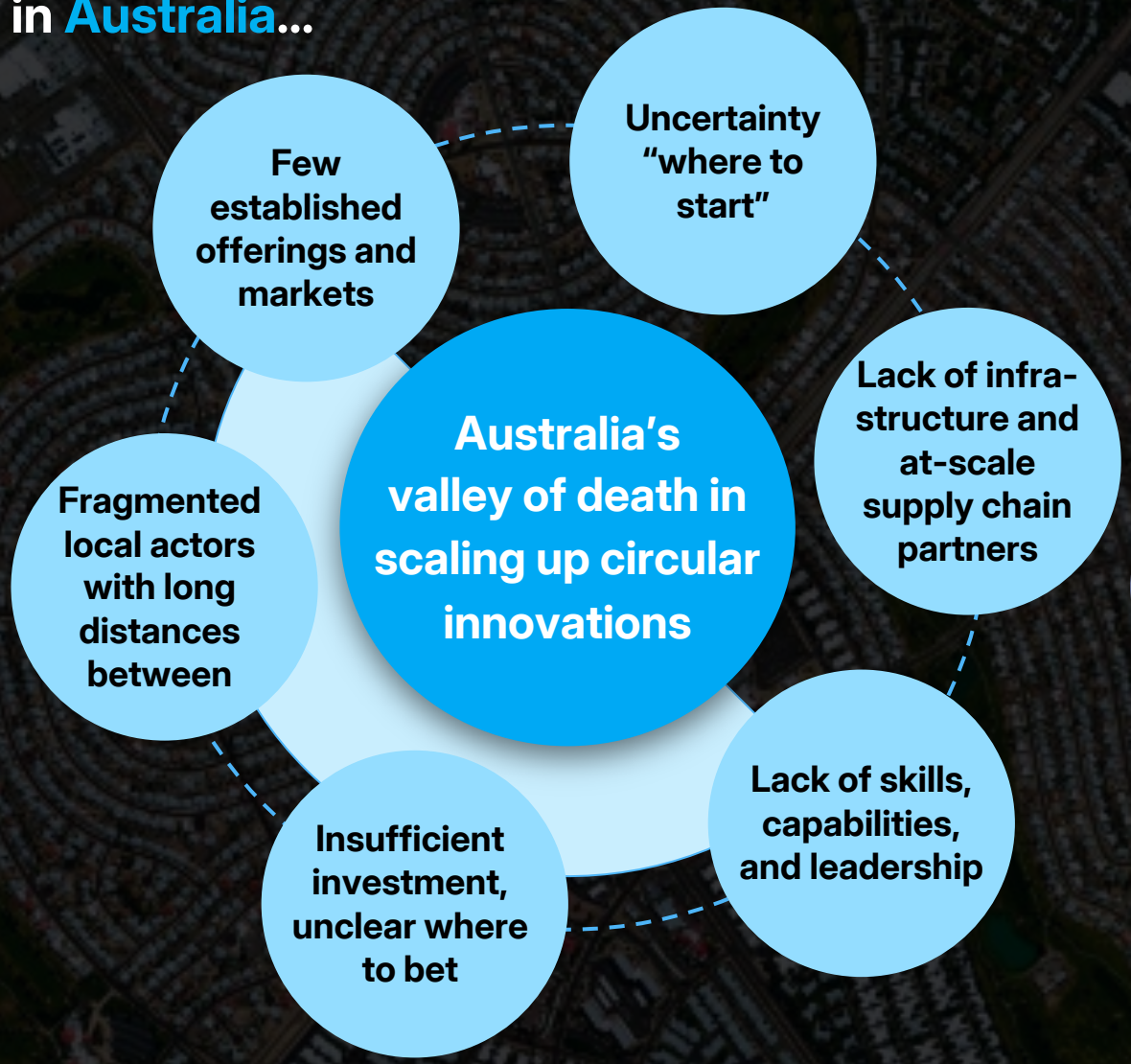
3rd

highest material footprint per capita in the OECD and the 4th lowest rate of material productivity

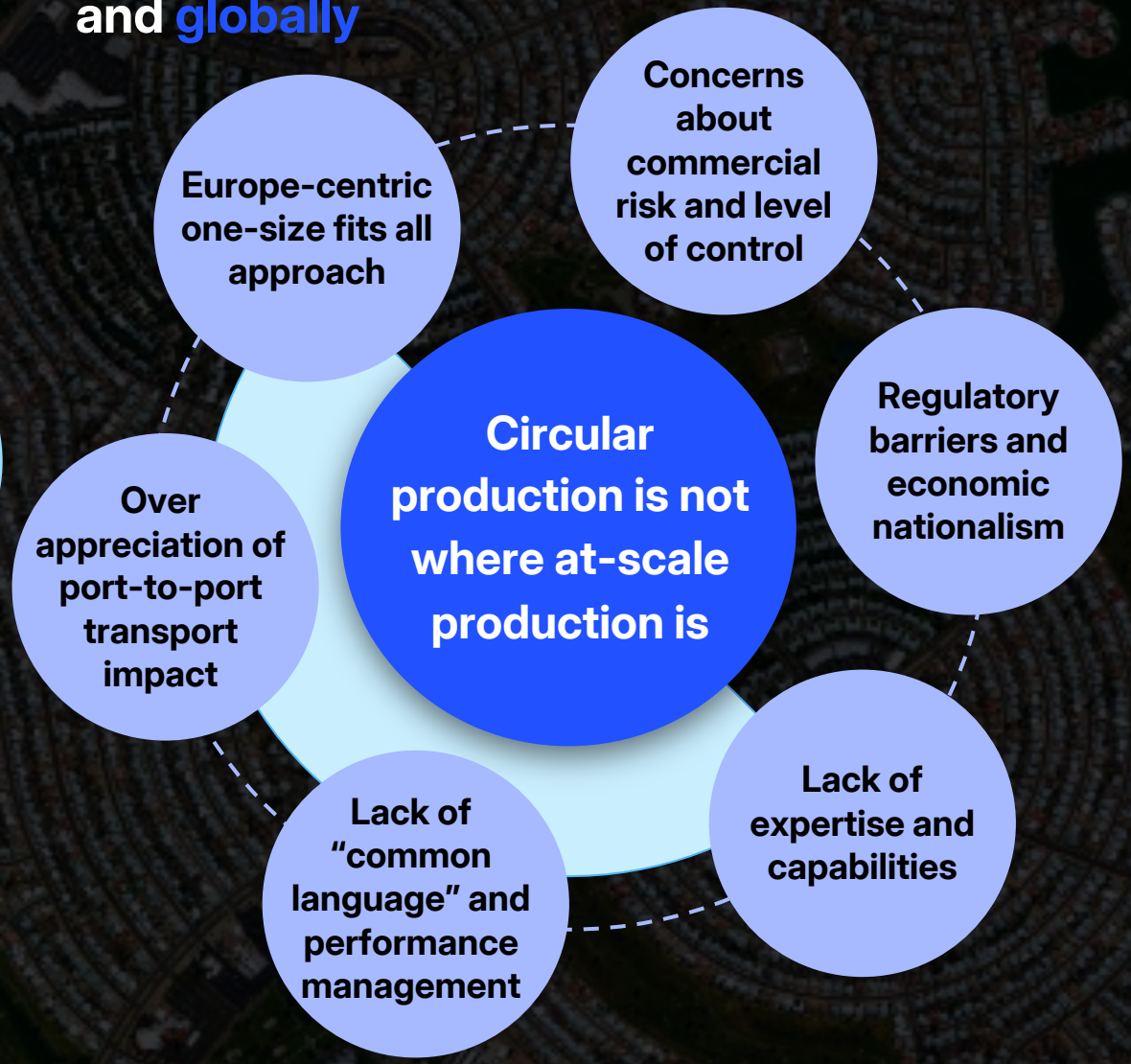
Source: CSIRO 2024, OECD 2024, CEMAG 2024, 2019 numbers

To match the solution to the size of the problem, we need to scale up circular solutions considerably

in Australia...



and globally



Source: MSDI analysis

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We know it is possible: Different circular business models have already been successful

You can follow 1 of 4 strategies

Cycle

Offers comprehensive **remanufactured parts portfolio**

Extend

Marketplace for **refurbished** consumer electronics

Intensify

Rents unit-load equipment, such as pallets, crates, and containers

Dematerialise

Pay-per-use and subscription models for health-care hard- & software

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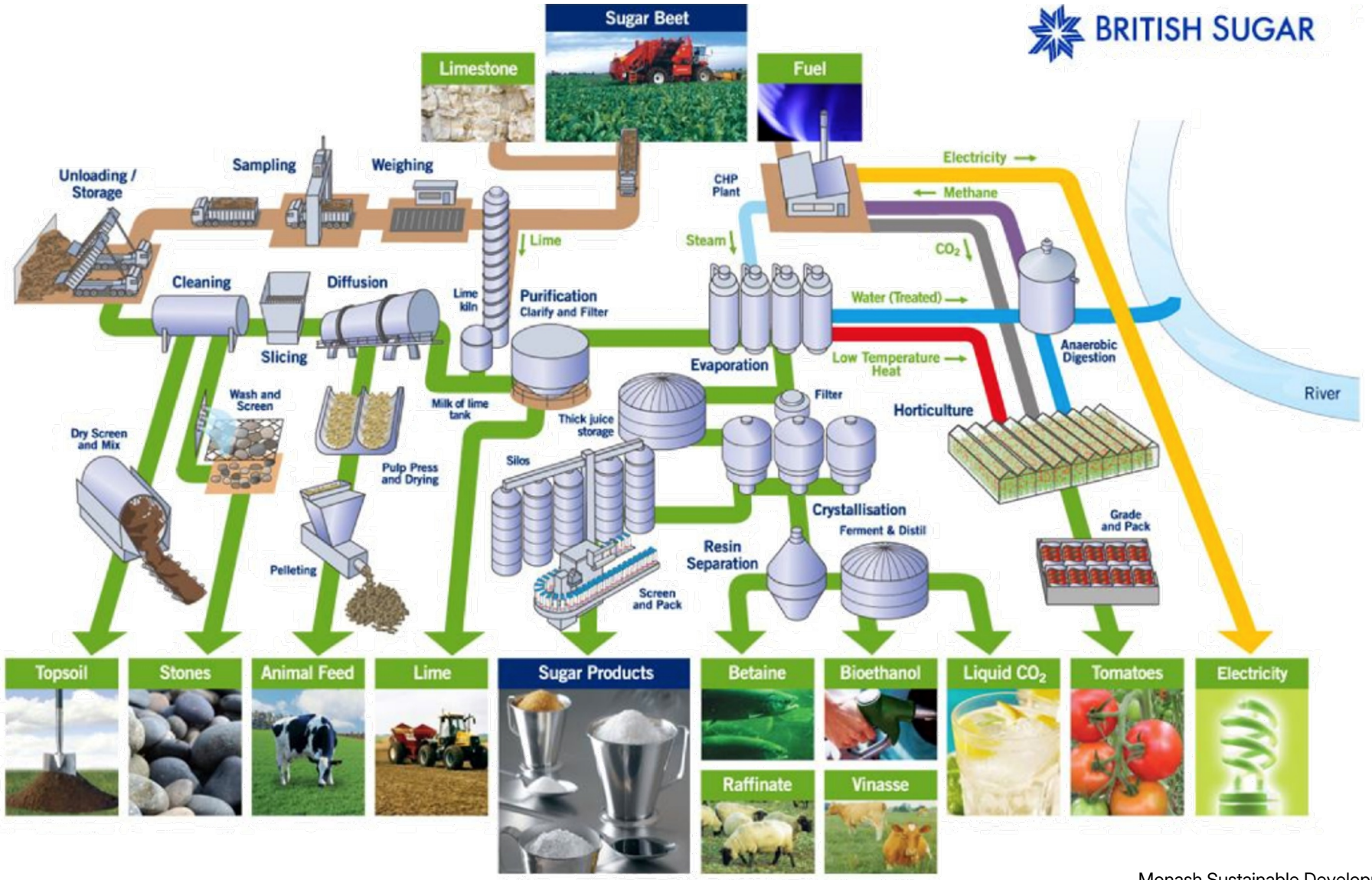
...or combine these

Uses **recycled materials**, provides **repair services** and **DYI guidance** and sells **used and refurbishes clothing** (Worn Wear program)

Uses **recycled materials**, offers **maintenance/repair solutions**, **pay-per-use models**, and **circular solutions consulting**

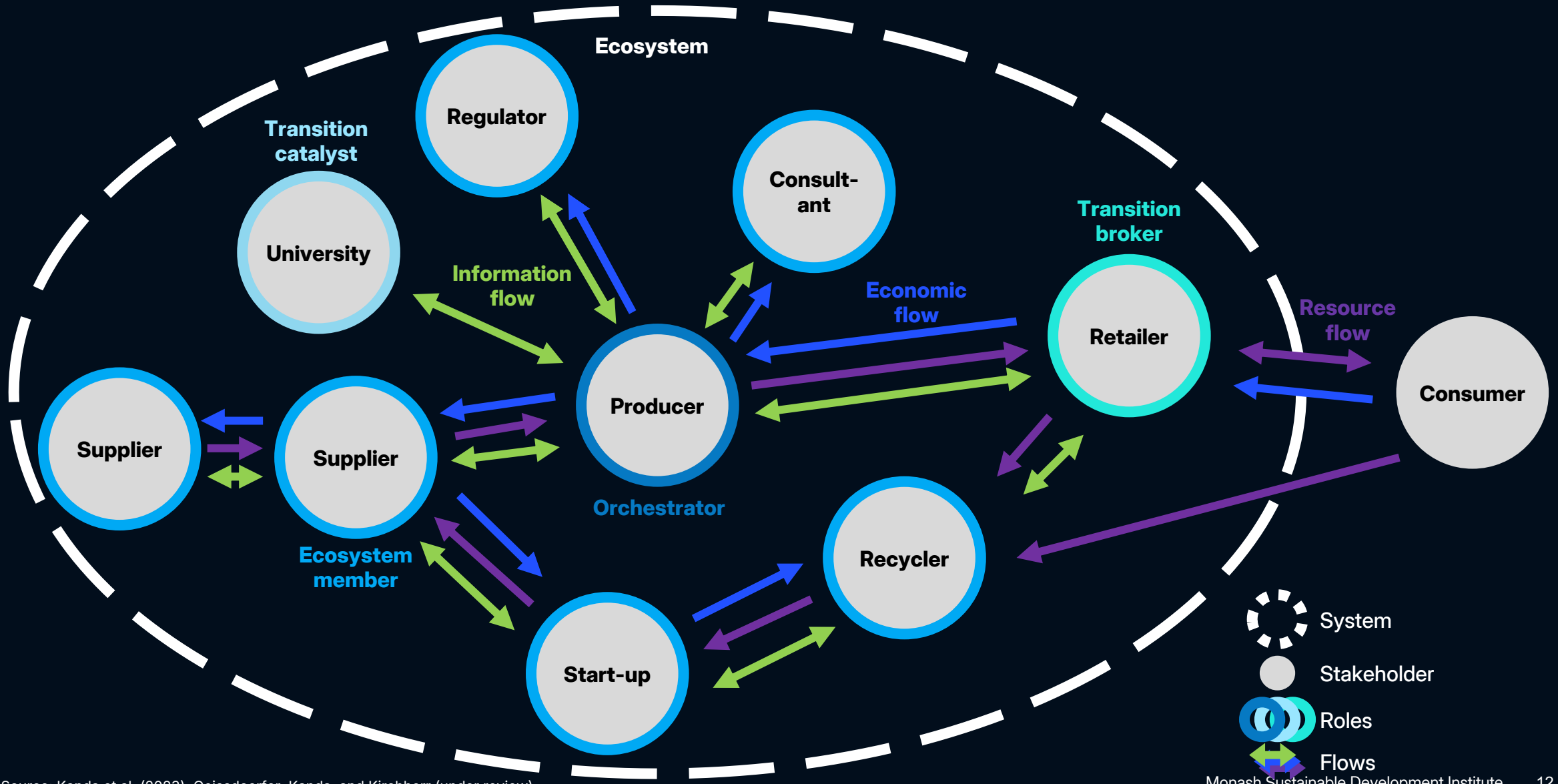
Source: Geissdoerfer et al. 2020, company websites

However, conventional business model-focused approaches often fall short for circularity-focused models



Source: Short et al. (2014)

Ecosystem design: In the circularity context ecosystems are often more adequate units of analysis than business models



Source: Kanda et al. (2023), Geissdoerfer, Kanda, and Kirchherr (under review)

Transition brokers: There is a range of potential stakeholders to initiate Circular Economy ecosystem design, incl. the public sector

Detailed next

Selected examples – for discussion

	Supply chain partnership	Industry consortium	Across-industry alliance	Public sector partner
Description	The lead brand supports suppliers in implementing the Circular Capabilities Frameworks and tracks and manages performance	Several leading brands partner to build joint CE manufacturing infrastructure and set industry-wide standards and guidelines	Overarching actors, such as WFSGI and other stakeholders becomes key partners in setting CE standards and guidelines for high-volume manufacturing outsourcing to Asia	Public sector acts as a convenor, investor, or quarterback for a consortium of supply chain partners
Benefits	High level of control Potential to capture CE capabilities and develop CE as USP	Shared risks and investments Creation of larger supplier pool with higher flexibility and lower production costs	Additional layers of credibility and environmental impact Potential synergies with cross-industry partners (e.g., creation of green shipping lines, co-innovation with CE start-ups)	Additional levels of support and stakeholder buy-in Added transparency and societal integration
Challenges	Identify, motivate and effectively steer supply chain partners Avoid lock-in	Maintain control Retain distinct CE offering, communications and brand identity	Achieve measurable impact Connect individual firms to impact and communicate their role	Public sector resources and expertise needed

Source: Preliminary, developed from literature review (incl. Cramer 2020, Savaget et al. 2024, Loorbach et al. 2017, Shabaz et al. 2022), and focus group discussions – to be further empirically tested

Role of public sector: There is a range of ways how local, regional, and national government and international partners can help

Selected examples – for discussion







	Convenor	Investor	Quarterback
Description	Public sector provides organisation, infrastructure, and facilitation to bring ecosystem partners together and engage them in meaningful discussions	Public sector assesses and invests in circular ecosystem business cases based on commercial viability, environmental impact, jobs creation, and regional innovation/competitive benefits	Public sector joins as an advocate and supports process through removing barriers and providing infrastructure (e.g., policy sandboxing, circular precincts)
Benefits	Cost effective Relatively flexible, quick to set up and scale up	Quicker results, higher success rates Easier to attract right partners into the room High level of transparency and contro	Can be more costs effective than direct investments Can create additional policy insights and a virtuous place-based cycle
Challenges	Strong champion or coalition of the willing needed to create momentum Third-party investments needed already in seeding phase	Meaningful and flexible resources needed	Hard to implement, contingent on electoral cycle Complex, political process depending on level of ambition / engagement

Source: Preliminary, developed from literature review (incl. Cramer 2020, Savaget et al. 2024, Loorbach et al. 2017, Shabaz et al. 2022), and focus group discussions – to be further empirically tested

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How to ecosystem: 3 example approaches



Contractual innovation

A contractual innovation to scale up green substitute ingredients to achieve competitive pricing



Capability mapping

An approach enabling the deliberate design of ecosystems



Public procurement

Catalysing local circular enterprises through public procurement

Pictures: Newtons, ZAG

Contractual innovation: A contractual innovation to scale up green substitute ingredients to achieve competitive pricing



Source: Aas et al. (2020), Global Salmon Initiative (2025), WWF (2025)

Capabilities Mapping: An approach enabling the deliberate design of ecosystems

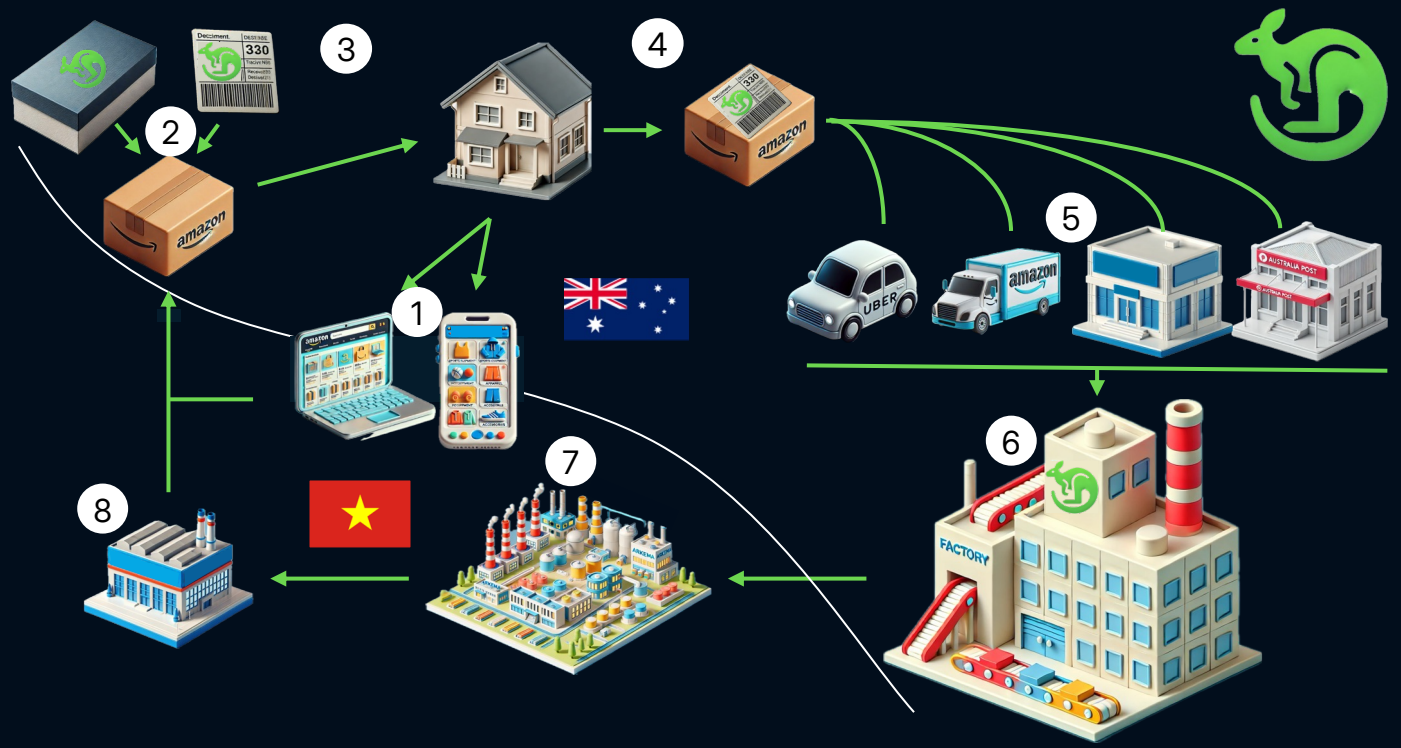


The tool



We are developing an ecosystem design approach

...that seems to work



Source: Geissdoerfer et al. (under review)

Public procurement: Catalysing local circular enterprises through public procurement

Councils are **powerful customers for local industry**, e.g., in construction and waste and facility management, especially in rural areas

Procurement guidelines with circularity requirements (e.g., recycled content, reuse of existing structures) can incentivise contractors to ‘go circular’

If done, right, this can efficiently shape local industries to **develop competitive circular business models**







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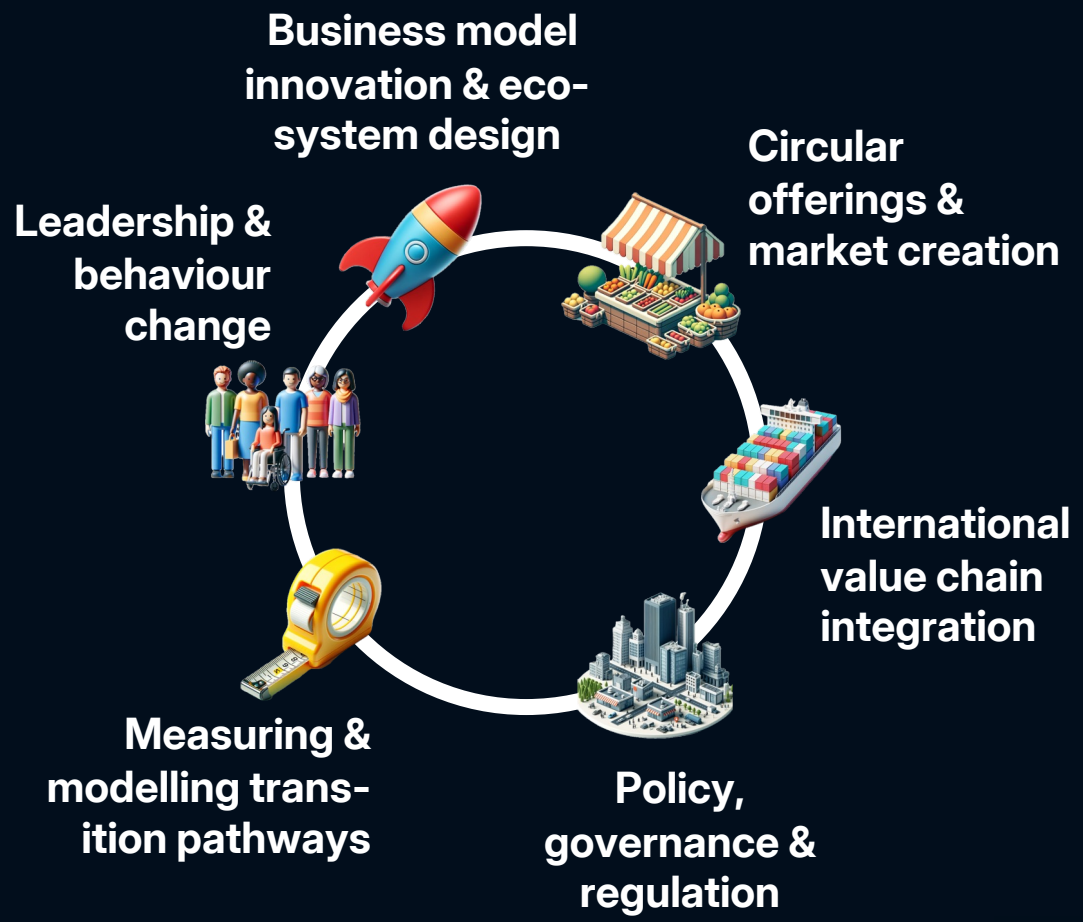
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Accelerating circular business consortium: Building a circular economy business & policy consortium

An industry & public sector consortium



...focusing on six acceleration levers



Test assumptions and solve key bottle-necks

Exchange experiences and develop skills

Develop tomorrow's CE leaders

Access a global network of the leading CE experts


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https://www.monash.edu/msdi/initiatives/circular-economy-labs/circularity-video