Catalysing the transition to a Circular Economy in Australia

The Commonwealth Scientific and Industrial Research Organisation

Executive Summary

December 2019

CSIRO

ThinkPlace

Introduction

What did we set out to do?

Catalyse a national dialogue on the Circular Economy: We set out to bring together key contributors from government, industry and academia to explore how we might catalyse a national dialogue on the circular economy to drive awareness, policy development, investment and partnerships to close the gaps.

The aim was to identify key opportunities and intervention points to facilitate a circular economy transition through policy, partnership and investment and supported by scientific innovation.

Purpose of this document

The purpose of this document is to capture a synthesised summary of the conversations and activities that took place during the co-design workshop held on 4th December 2019.

This workshop was held to start a conversation on how might we stimulate the transition to a Circular Economy in Australia.

Please note that this document does not capture the conversation verbatim, rather it presents a snapshot of key discussion points and activities.

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Workshop Attendees and What emerged?

Who was part of the workshop?

34 Participants

7 – Government

Dept. of Environment and Energy, NSW Dept. of Planning, Industry & Environment, VIC Dept. of Environment, Land, Water and Planning, Dept. of Industry, Innovation and Science, National Waste and Recycling Industry Council, Government of South Australia

14 – Research

NSW Circular Economy Innovation Network, CSIRO, ASPIRE, Planet Ark, Australian Packaging Covenant Organization, University of Technology, Sydney

13 – Industry

Woolworths Limited, Suez, Veolia, Coles, Lendlease, IKEA, BHP, Australian Chamber of Commerce and Industry, Chemistry Australia

What emerged…

10

Visions for the future:

Visions that the participants had for the Australian Circular Economy in 2030.

72

Ideas:

Ideas targeted towards how might we stimulate the transition to a Circular Economy.

27

Concepts:

Developed through clustering ideas and ready to be scaled up into projects .

What is our vision for the future?

Participants identified their visions and what would be present in the Australian Circular Economy in 2030.. This slide captures a synthesized summary of their responses.

The Australian Circular Economy in 2030 will be a place where:

- Sustainable behaviour is recognised and rewarded.
- The economy will be carbon neutral
- Organics are returned to source
- Incoming products are designed to be absorbed by the economy, society and environment
- There will be improved quality of life across the economy and community
- Waste is no longer a word
- There will be coordination of regulatory environment and incentives across all three levels of government
- There will be proper pricing of resources and externalities

Elements that will be present in 2030 that do not exist now :

Incentives for the circular economy	Communal mobility transport	Product repair services	Value-added export
Longer life-time building across materials	Reduce resource/ material/energy intensity	SDG credit currency	Better labels – recycling, etc
Pricing externality	Planning	Markets to match and trade	Value recovery from waste
Targeted policies, regulations and standards	Good data collection and usage	Service economy	No waste

What is our starting point?

Participants built the current state of the Australian Circular Economy and reflected on who are the people involved, what currently works well in the system and what are the pain-points that need to be addressed. This slide captures a synthesized summary of their responses.

What currently works?

- Data collection
- Media coverage
- Digital platforms
- Some materials circulate well
- Consumers demands driving change
- Innovations and technical solutions
- Pockets of excellence
- Industry champions
- Investment in renewables
- System enables collaboration
- Government awareness
- Good intentions

What are the pain-points to address?

- Some materials do not circulate well (eg. textiles)
- Immature business models
- Economic system complexity is declining and not adapting
- Limited incentives: Capitalist model ensures only financial incentives are prioritised
- Playing field is unequal
- Geographical limitations as Australia is a vast land
- Infrastructure to carry renewable energy is missing
- Requirement of complex technology
- Potentially finite businesses to operate
- Some product volumes are low for the economy to be able to recycle them
- Australia's import/export model
- Manufacturing industries are unable to adapt and improvise quickly
- Siloed thinking
- Regulatory barriers & standards
- Legal contracts limit capability
- Data aggregation exchange dollars use – wrong granularity
- High rates of non-renewable consumption
- Lack of education and knowledge
- Lack of national coordination
- Misalignment of incentives
- Focus on least cost rather than whole life
- Lack of price signals for positive behaviour
- Resource security/scarcity
- The linear economy works well
- No value on waste
- Innovation and technology doesn't meet the consumers expectations

How do we get there?

The second half of the workshop was devoted to ideating how might we work towards our vision for the Australian Circular Economy of 2030. The Core Design team made up ThinkPlace and CSIRO members created the following 'How Might We' questions* to guide the ideation and conceptualisation in the next stage of the workshop. The 'How Might We' questions reflect inputs from the participants sharing their thoughts on the current system and their future vision for 2030.

How Might We…

Question 1

…Create incentives for engaging in the circular economy?

Question 2

…Shift supply systems from linear to circular?

Question 3

…Create markets to exchange resources, materials and recover value from waste?

Question 4

…Create metrics, data and incomes to monitor and respond to progress?

Question 5

…Design for durability and usability (repairability)?

Question 6

…Develop regulations, standards and policy across all three levels of government?

*The Core Design Team created a longer list of How Might We questions through the inputs of the participants from the first half of the workshop. However, in the interest of time 6 'How Might We' questions were taken into the second half of the workshop to guide the ideation and conceptualisation process.

How do we get there?

Each table was assigned a ‘How Might We?’ question and participants were encourages to sit at a table covering ‘How Might We?’ question that they were interested in/were currently working on. Each ‘How Might We?’ question had a mix of perspectives, as there were participants representing the interests of government, industry and research.

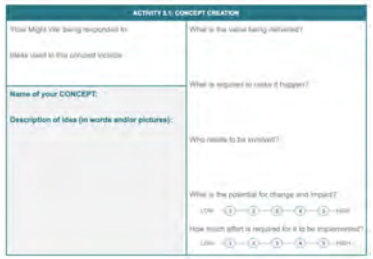
Step 1 : Ideation

The participants were taken through a rapid ideation training process prior to this activity.

Participants were asked to put down as many ideas as they could on post-it notes as an individual activity. Post that, they shared their ideas with others on their table.

Sharing of ideas help them flesh their ideas better and document them on a Idea Card (*left*).

Step 2: Conceptualisation



Post their ideation session, participants were asked to cluster their ideas to create concepts.

The concepts brought together multiple ideas to create a strong concept that can be fleshed out into a project in the future.

Participants captured their concepts on a Concept template (*left)*

Question 1	14 Ideas generated	5 Concepts designed
Question 2	12 Ideas generated	3 Concepts designed
Question 3	20 Ideas generated	5 Concepts designed
Question 4	11 Ideas generated	10 Concepts designed
Question 5	10 Ideas generated	3 Concepts designed
Question 6	5 Ideas generated	1 Concepts designed

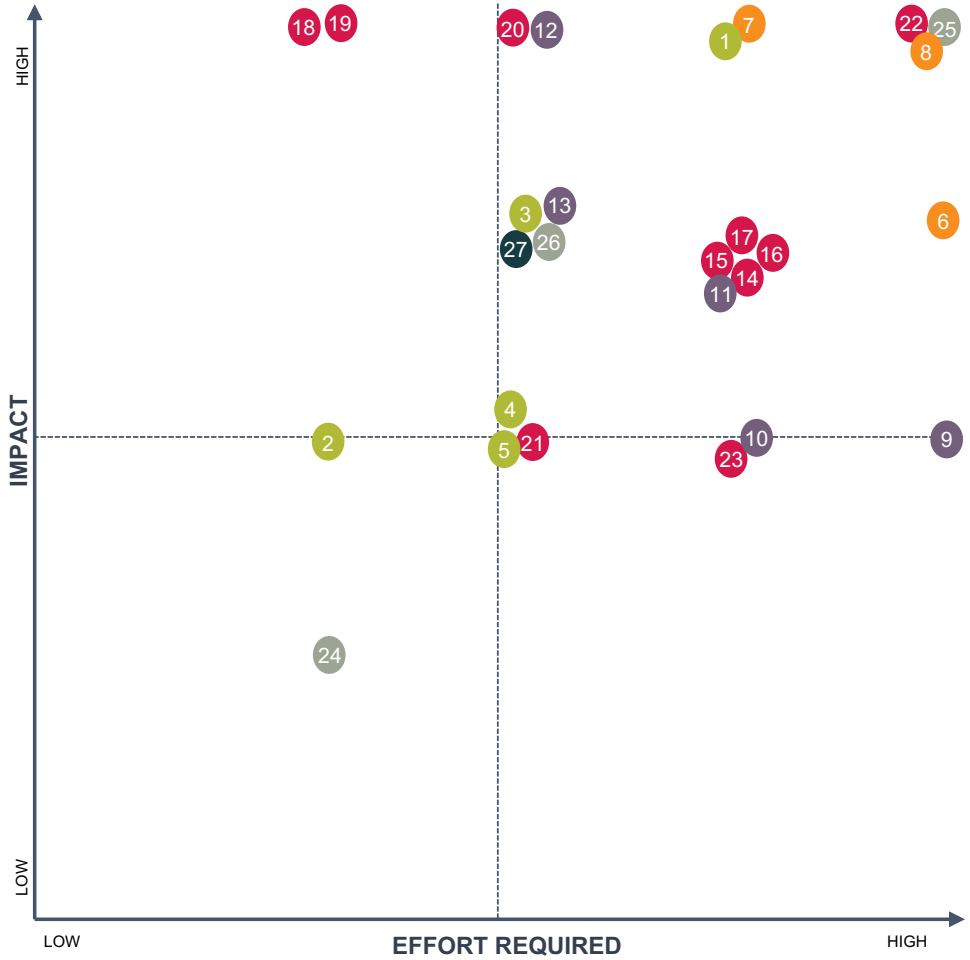
72 Ideas targeted towards how might we stimulate the transition to a Circular Economy were generated.
All the Ideas can be found in the Appendix (pg 12 & 13)

27 Concepts were developed through clustering ideas and ready to be scaled up into projects.
All the Concepts can be found on the next slide

Concepts mapped on the prioritisation matrix

Participants shared ideas and developed them into concepts to be turned into projects in the future. Participants rated their concepts based on their potential for impact/change and the effort required for implementation. This slide is a synthesised summary of their responses.

CONCEPTS MAPPED ON THE PRIORITISATION MATRIX



Question 1

1. National targets for waste reduction, infrastructure, procurement, etc.
2. Provide incentives to business and consumers through banking and smart finance.
3. Create different models, collaborations structures of funding for innovation agents.
4. Legislate minimum standards that take into account end-of-life and develop a rating scheme that supports customer purchase.
5. Conceptualise the product as a service and lay the responsibility of the product with the manufacturer through the product's life.

Question 2

6. Redefining housing and appliances by creating housing pods furnished by leased appliances.
7. Incentivise companies financially for the level of recycled/recovered materials in their product and penalise those using virgin materials.
8. Optimise use of transportation through data-driven sharing of transport for passengers, materials, products including reverse logistics.

Question 3

9. Financially incentivising use of recycled commodities.
10. Raising awareness about CE through a voluntary star rating on products to indicate it's circularity.
11. Creating Industry standards for recycling.
12. Creating a platform like the ASX to assign value to commodity resources, validate, trace and regulate resources to create opportunities for global supply chains.
13. Develop a connection Hub to facilitate the economically efficient movement of materials in the CE.

Question 4

14. Product specific metrics to allow better circular consumption and procurement.
15. A live national, accessible database used for mandatory reporting that allows for real time tracking material flows.
16. National annual progress report on the implementation of circularity.
17. Data metrics that are inclusive, relevant, mutually achievable and symbiotic and focused on actuals that can be measured.
18. Publish guides and case studies that include tools and information to equip practitioners.
19. Survey universities, tertiary, private sectors, R&D institutes to qualify capabilities, gaps, opportunities, ideas, applicability to the global problems to be solved, scalability and technical requirements, skills, knowledge, etc.
20. Identify and develop capabilities around collecting data, assessing, monitoring and simulating scenarios for CE.
21. Develop reporting requirements and ensure certainty of accurate, timely data from credible sources like ABS, ATO.
22. Develop CE accounting standards for commonality of definitions, measurement points, etc.
23. Business and industry can use roadmaps as a guide to feed into strategy and actions that are measured sector-wise.

Question 5

24. Implement alternate models of use and ownership by increasing the intensity of product use through different ownership models.
25. Informing and inspiring design for durability and reusability. Aim to create a movement to develop an emotional connection to 'stuff'.
26. Individual households have self-sorting and self-reporting waste bins and all waste is valued.

Question 6

27. National, independent government agency focused on working with government and industry to driver circular outcomes that is similar to Green Industries.

What next?

Participants were requested to write down one thing they were going to do back at their place work because of something they learned at the workshop, a concept they created or a relationship they developed. The following slide documents their responses.

Connect and collaborate with cohorts across government, industry and research more strongly in the future.

- Collaborate for digital infrastructure and digital ideas
- Connect with relevant agencies (APCO NSW Circular, etc) to co-ordinate not duplicate the Circular Economy
- Invest more time in collaboration
- Will maintain networks to have further discussions on the CE in the built environment
- Discuss with my team internally
- Reach out other participants to continue the discussions
- Think of closer collaborations with CSIRO and others for joint initiatives
- Discuss potential for developing targets for industry and government with key actors

Active advocacy related to the Circular Economy within internal teams and projects in the future.

- Will write some of these ideas into APCOs policy submission on Infrastructure Victoria's advice to Victorian government on waste and recycling infrastructure needs
- See how I might be able to apply these learnings and ideas
- Make sure Circular Economy in a core in research at CSIRO
- Share that this workshop occurred with my CSIRO team, my national network (Universities), retailers and government. I will mention how powerful it was, starring a national conversation.
- Be inspired to work as hard as possible in my role to help communicate all these great ideas, expertise, actions to Australia through the National Circular Economy Hub
- Use Circular Economy language in Policy

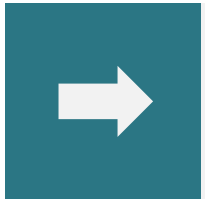
Injecting considerations, actions and recommendations on current and future projects.

- Integrate ideas on incentives into stewardship program development
- Try to inject or increase consideration of Circular Economy in all future projects
- Submit innovation ideas to our Research and Development department and executive team.
- At IKEA: As a result of what I have learnt and contributed today, from tomorrow I will use these learnings in leading a zero waste workshop tomorrow
- Continue to do what I have been doing but start to implement more Circular Economy projects and influence and include more decisions makers

What next?

CSIRO is committed to play a coordinating role for growing the national circular economy conversation and will coordinate the effort of the Australian innovation system and the collaboration with industries and governments.

We are planning a follow-up workshop in June/July 2020 to explore the potential of a National Circular Economy Initiative.



CSIRO is preparing an innovation and technology roadmap for plastics, tyres, glass and paper for the department of Industry, Innovation and Science which will become available in June 2020.

Appendix

- List of Attendees
- List of Ideas developed as part of the Ideation Activity

Who was part of the workshop?

Name	Role	Organisation
Allison Ball	Manager, Energy Statistics	Dept. of Environment and Energy
Anders Hallgren	Chief Operating Officer	NSW Circular
Anna Kaksonen	Group Leader	CSIRO
Anna-Liisa Lahtinen	Director – National Waste & Recycling Taskforce	Dept. of the Environment & Energy
Asha Kayla	Circular Economy Programs	Woolworths Limited
Ben Goodgame	Major Account Manager	SUEZ
Cameron Mckenzie	Chief Executive Officer	Aspire
Cathy Foley	Chief Scientist	CSIRO
Charlie Crane	Head of Innovation	Veolia
Colleen Macmillan	Senior Research Scientist	CSIRO
Fiona Baxter	Group Manager, Responsible Resourcing	Coles
Greg Bland	Strategic Account Manager	CSIRO
Heinz Schandl	Senior Science Leader	CSIRO
Jeremy Mansfield	National Sustainability Operations Manager	Lend Lease
Jo Cooper	Project Officer, Sustainability Advantage	NSW Dept. of Planning, Industry & Environment
Karen Greaves	Sustainability Manager	Lend Lease
Kathryn Ringvall	Sustainability Leader	IKEA
Kathryn Franklin	Sustainability Manager	Coles
Libby Chaplin	Chief Executive Officer	Battery Recycling

Name	Role	Organisation
Lola Jones	Policy Officer	DELWP
Mario Herrero Acosta	Chief Research Scientist	CSIRO
Natasha Flores	Industry Growth Division	Dept. of Industry, Innovation and Science
Nell Macdonald	Programs Development Manager	Planet Ark
Nick Florin	Research Director	University of Technology, Sydney
Paul Klymenko	Chief Executive Officer	Planet Ark
Peter Bury	Director - Strategy, Energy and Research	Chemistry Australia
Peter Brisbane	Government Partnership Manager	Australian Packaging Covenant Organization
Peter Bruce	Chief Executive Officer	Whenceforth Consulting (for Woolworths)
Raj Gaire	Senior Research Engineer	CSIRO
Rose Read	Chief Executive Officer	NWRIC
Ross Lambie	Chief Economist	Australian Chamber of Commerce and Industry
Sally Martin	Principal Portfolio Strategy and Development	BHP
Sandra Fox	Strategic Account Manager Government	CSIRO
Sarah King	Senior Research Consultant	CSIRO
Vaughan Levitzke	Chief Executive Green Industries SA	Government of South Australia

Appendix 2: Ideas generated in the workshop/1

Create incentives for engaging in the circular economy

- Embed CE with current education systems
- Pricing schemes for CE for products and services that include transparency, incentivise consumption of Circular Economy products and reward consumers and producers
- Change taxation regulations to incentivise CE. eg. no GST on recycled materials
- Using a series of tax breaks for rewarding different aspects on the CE (manufacturing, etc)
- Smart banking will provide tailor-made financial products for CE developers and upscalers
- Put higher price on waste to landfill
- Hold a national level competition with desirable prizes and have a CE category
- Create different models of innovation funding for different technology developers, scalers and users
- Products with high CE value have barcodes that can be scanned into an app and points accumulate towards community benefits like a community garden
- Provide more household bins and convenient locations for product collection. eg. Bunnings
- Government targets for CE products procurement – establish social and environment criteria
- Identify and advertise national targets to achieve circularity in the economy
- Make the manufacturer responsible for maintenance and end of life
- Certification scheme with a universal product stewardship trademark

Shift supply systems from linear to circular

- More local manufacturing of products to shorten travel distance between supply chain elements
- Companies get products rated on the basis of how circular they are
- Tax debt for each product that goes into a fund to restore/repair the environment
- Design so that can be disassembled
- Company who put products on the market get tax credit for % of recovered content in the product
- Mining companies own metals through out the whole life-cycle and lease them for different uses, collection and recycling included
- Service provider retains ownership/responsibility for physical asset and takes it back for reuse and recycling
- Create flexible housing pods for suburban living to allow the house to adapt to the lifecycle of the residents
- Create a circular agriculture sector
- Use data on materials and product flows to make the supply chain more efficient
- Cars in the city are solely owned by the community, they are electric and self-driven and should be ordered online
- Bring manufacturing and waste recycling industries together to develop smarter ways to more materials through the supply chain

Create markets to exchange resources, materials and recover value from waste

- Government to stipulate the materials to sorted by Materials Recovery Facilities
- End of life costs or the costs of cycling are built in as a deposit to drive recovery
- Develop monetary and other incentives to use recycled material
- Create demand for secondary materials by promoting them as an input in their product for those wanting traceability and sustainable value chain
- Creating incentives for resource recovery and disincentivise virgin materials
- Raise the value of materials by removing the ‘cheap and easy’ options of landfill and export
- Linking lending to sustainable outcomes
- Government commitments and policy to purchase reuse/recycled products to drive markets
- Creating opportunities for global supply chains for new materials
- Many new and improved markets will need to flourish to support this
- Create a platform to assign to each community
- Online trading platform modelled on the stock exchange that validates resources with traceability, trusted standards and regulated product listing
- Identification of new commodity on markets such as Australian Securities Exchange
- New or existing products with recycled input
- Investment in technology, infrastructure and start-ups to recover value from waste
- Government introduces a voluntary circular star rating to demonstrate how circular the product is

Appendix 2: Ideas generated in the workshop/2

- Policies, regulations, guidelines that set rules/targets for value recovery from waste and specifications for recycled products to enable material reuse and create a fair and level playing field
- Correction Hub to facilitate the efficient and economy movement of material. May include regulatory instruments like ‘empty truck ban over 20 km
- Lowering the cost of materials by investing in research and development of recycling material separation systems and collection
- Increase awareness on the benefits to the individual communities and the economy of CE

Create metrics, data and incomes to monitor and respond to progress

- Need for credible data that can be used for for mandatory reporting: Allows for traceability and analysis to make a decision
- Business can use sensors to track products and materials and people can feed in data using their mobile crowd sensing platform
- Answer key questions on economic opportunities of CE for Australia. Call to arms “Australia is 2% circular”
- Measures that measure incrementally, simple not simplistic, achievable, engages industry/government/public, links to the SDGs and uses a waste hierarchy
- An ISO level standard for commonality of measurement points and definitions (similar to LCA)
- Product specific metrics to allow better circular consumption/procurement decisions
- Need to incentivise data sharing by sector and be clear about what data will be collected by whom and why
- How-to guides, case studies of successful outcomes of collection and metrics within the CE
- Metrics are inclusively relevant and mutually achieved and focused on actual things to be measured like energy, weight, durability and benefit
- Databases, blockchain, online supercomputer modelling to test future scenarios of the CE
- Survey research I\institutes, universities, private sectors around innovation, problem solving, technology systems

Design for durability and usability (repairability)

- Individual households have self-absorbing and self-reporting waste bins and all the waste is valued
- Collective ownership of commonly needed, low intensity goods (eg. lawn mowers)
- Connect service repair providers with customers, Air-tasker like set up focused on common good categories (electronics, furniture, etc)
- Through an open source toolkit, make it easier for designers, manufacturers and consumers to access information on how products can be repaired
- Allow for social change needed to support the better design of products and the systems that support their use and recovery
- Most design standards (built environment and infrastructure) are singular hazard based – we need multi-hazard based assessment in design
- All manufacturers should adhere to clear set of guidelines for products. People have an emotional connection to their products beyond price and materials are valued
- Inspire the design community to look differently at design solutions
- Quality materials manufacturing throughout supply chains, supply chains support take back of products and include repair and reuse at multiple points in the supply chain
- Establish parameters for whole of life design, reparability, designing out waste, lifespan of goods and durability factors

Develop regulations, standards and policy across all three levels of government

- Principle based regulation that can be flexible to respond as intended to different and changing situations
- Establish clarity on the roles and responsibility of each level of government and portfolios
- All levels of government collaborate to identify, collect and analyse data to determine the problem
- Australian government co-ordinates and/or leads development of standards and specifications for the use of recycled content – eliminate barriers to using these materials
- Real and genuine collaborations between levels and agencies of government through coordination from Australian government, proper resourcing, real willingness from all sides of politics, secondments and co-working, regular and frequent meetings and engagements

ThinkPlace

thinkplaceglobal.com

From ThinkPlace Australia Pty Ltd | ACN 625 156 845 | ABN 56 625 156 845
Level 4, 50 Blackall Street, Barton ACT 2600 | PO Box 5249 Kingston ACT 2604 | Phone +61 2 6282 8852