

Barriers and Opportunities for a Circular Economy in northern Australia

I am writing the following comments as a researcher working at the Charles Darwin University and living in the Northern Territory. My research focuses on ways to implement a Circular Economy (CE) in remote and very remote Indigenous communities of the Northern Territory. I have conducted research on CE of Solar panels, construction waste, disaster waste, agriculture waste and municipal waste in the Northern Territory.

My key recommendation is:

There needs to be a separate Circular Economy plan for Australia's remote regions (mainly northern Australia) under the National Waste Policy. Currently one National Waste Action Plan drives waste management for both urban and regional/remote/very remote regions.

The primary barriers to implementing a circular economy in northern Australia is that decisions are made regarding circular economy at the national level that don't take into account the very particular geography, and socio-cultural characteristics of northern Australia. The need for aligning to the National Directive has adversely impacted the Territory Waste Management policies. Abandoning the earlier approach to waste management that addressed the challenges of distance and disadvantages of remoteness, the NT government's 2022 CE policy aims to replicate the National Waste Action directive of adopting a CE. In the process, the approach is not grounded anymore in the local realities.

The following sections address barriers and opportunities for municipal waste, construction waste and waste from solar panels and disasters.

Municipal waste in remote Indigenous communities

Currently a cookie-cutter approach to CE solutions is advocated which leaves the local governments struggling to implement it in their jurisdictions. This creates a tension since the regional councils want to comply but cannot. The barriers faced to implement a CE are:

- Data on waste volumes: There are no weighbridges in the remote communities and therefore no data on existing waste volumes or rates of generation. Lack of consistent methods for measurement and accounting for waste streams presents a significant challenge for waste management reforms. Not having this information puts them at a disadvantage when engaging with material recyclers which require this information before they can organize any collection.
- Collecting landfill fees: Most landfill sites are not manned so very little capacity to collect any landfill fees which would go towards CE initiatives
- Vandalism: All remote landfills segregate and stockpile the recyclable waste. The landfills often experience vandalism or arson of stockpiled tyres or cars so loss of resources that can be potentially recycled

- Challenges with accumulated waste: For general waste, there is little option for the landfill staff but burning it periodically. If they didn't, depending on the region, there are flies, pigs, dogs and horses over the rubbish piles.
- Limited infrastructure: Some remote communities don't have all the infrastructure (For example, back hoe loader, excavator) required to carry on everyday sorting and stockpiling of materials. not always have the equipment to do certain jobs.
- No funds of CE: Remote regional councils have a small rate base and are dependent on external funding to implement CE programs
- Connecting with recycling organizations: There are significant challenge in trying to organise ways of getting recyclables out of the community. Landfill staff are overwhelmed with trying to find recyclers for the different stockpiled materials and then organising transport for getting the material to the recyclers, on top of carrying out their regular jobs. With low material volumes and expensive transport, the materials are left stockpiled on the communities.
- Transporting waste: Councils need to organise transport for recyclables over long distances to reprocessing centers in South Australia, Queensland and Victoria. The remote islands have additional issues of having to barge the waste to Darwin. This increases freight costs and transport emissions. This has resulted in the local councils to stop collecting a particular material stream, for example, glass.
- What is the next step: Waste managers have little knowledge of what to do with separated recyclables since each recyclable needs to be sent to a different reprocessing centre.
- Product Stewardship schemes: Very few PS schemes contribute towards transporting recyclables from remote regions. As a result, existing schemes have limited impact in remote regions
- Failure of government funding initiatives: National and territory government recycling funding schemes (Recycling Modernization Funds) ask for co-contribution, which the local governments and small businesses struggle to provide. In others programs (Modern Manufacturing Funds, CRC-P) local councils can't be the lead applicant.
- Reports on CE: FIFO consultants are commissioned to produce reports on CE in the NT. Lack of understanding and familiarity with local conditions result in either superficial, too general or unimplementable reports.

For details see report: <https://researchers.cdu.edu.au/en/publications/academic-review-of-future-waste-management-strategies>

Ways forward:

- Providing information: Regional councils need more information, or a quick reference guide on who to contact for PS schemes since staff are time poor
- PS Schemes: PS administrators should explore specific solutions for the remote Indigenous communities and not generic ones. Product Stewardship Schemes

need specific design elements that support recovery and transport from remote communities.

- Partnerships for delivering a CE: Transport and logistics companies need to be part of conversations for delivering CE solutions. Through partnerships with logistics companies, back-loading arrangements can be made to reduce costs.
- Funding schemes: Funding schemes need to be designed so that grants can help regional councils invest in waste data collection, buying basic machines, help in transporting recycling and accessing information on where to send waste for processing.
- Containers for Transporting recyclables: Regional councils would benefit if provided with containers that can store and recyclables and then transported. For examples, drums for storing and transporting waste oils.

Solar panels

This is rapidly becoming a huge issue in the territory with no policies guiding its collection, storage or transporting details. It is not classified as e-waste yet. The retailers are stocking solar panels in their stores and landfill managers are unsure to accept or not since they don't know a way of disposing them. The barriers to solar panels becoming part of a CE is that they are not designed to be repaired and recycled; policies do not target at ways of extending their lives on roofs, and few options for remote regions to participate in a 2nd hand market. Other barriers for a lack of a CE of Solar panels are:

- costs associated with collecting and transporting removed panels;
- lack of policy direction by the Government for PV panel collection or disposal;
- lack of information on PV panel recycling;
- lack of PV panel tracking;
- small volumes of waste in remote regions;
- lack of repair and reuse options; and
- warranty of products

For more details of this see papers:

Do solar energy systems have a mid-life crisis? Valorising renewables and ignoring waste in regional towns in Australia's Northern Territory

(<https://www.sciencedirect.com/science/article/pii/S221462962100027X>)

Transitioning towards a circular economy solar energy system in Northern Australia: insights from a multi-level perspective

(<https://www.tandfonline.com/doi/epdf/10.1080/07293682.2023.2200956?needAccess=true&role=button>)

Construction and demolition waste:

This is one of the largest contributors to waste volumes. Some of the barriers are:

- In northern Australia, it is the state and territory governments that funds most large projects. Even if there is a tokenistic mention of disposing C&D waste in contracts, there are no measurable ways of checking compliance.

- There is little in contracts that recommends using materials with recycled content.
- There is a need to build a market for promoting a CE
- Too often the pressure is on the builders to do the right thing with the waste generated but since it is not their contracts, there is little incentive for them to implement CE measure.
- Local governments who are responsible for waste management are not consulted when a new building project is commissioned, so as to have the right conditions in the tender for improving waste management.

Ways forward:

Buy in from clients/developers for a CE participation: Clients commissioning a construction project play a critical role in decision making for participating in a circular economy. Incentives need to be targeted at the developers/clients to adopt a CE. Incentives and awareness programs need to be targeted at the clients, project managers and developers who are in charge of commissioning, managing or drawing up contracts in a construction project. To increase chances of successful integration of a circular economy in construction projects, it is more important for these leaders to create conditions for a circular economy to occur rather than only relying on technological solutions of recycling.

If 'diverting from landfill' is inscribed in their policies, there is higher chance of bringing about change in construction practices for other projects in the territory. This needs to follow through in the procurement policies too.

Having a separate Green Rating system for buildings (with weightage for waste) in the regional areas will be another incentive for developers to engage with a CE. The current Green Ratings are difficult for developers in regional areas to comply with since they are designed for urban buildings.

Regional context and SME's: Most businesses in construction in the NT are small and medium sized. The small sizes of businesses (architects, builders, sub-contractors) faced the barrier of lack of knowledge about how to reduce and manage waste. They don't have the time to learn about CE when they are short staffed and time poor. Peak body associations for building contractors and architects, (the Master builders, HIA, And Institute of architects) need to have CPD that addresses ways to include CE in their everyday practices.

Report can be provided on request.

Disaster waste: Large amount of waste from disasters are posing a huge problem for the regional local governments and the Emergency services. There are no disaster waste management guidelines that show a clear path to a CE for the various jurisdictions. It is critical to include this waste stream in all CE plans since disasters generate 10 to 15 times the annual waste volume for a region.

Report on managing wastes from disasters can be provided on request.