Place-based circular economy initiatives

Supporting Communities and Regions to Transition to a Low Carbon and Circular Economy

The challenge, ambition and response

Australia is committed to evolving its economy to enhance living standards and reduce environmental impacts by achieving net-zero emissions and fostering a circular economy. Local councils, tasked with delivering community services at the grassroots level, face the tangible challenges and opportunities this transition presents. By fostering liveable, vibrant, and sustainable communities, councils can attract top talent, support thriving industries, and promote diverse employment opportunities. This vision is underpinned by investments in affordable housing, quality services and facilities, necessary transport and infrastructure, cost-effective food and goods options, renewable energy sources, and enabling circular business models. The planning and investment decisions made by councils are critical for facilitating and accelerating a low carbon and circular economy transition across their region. Moreover, their leadership and collaborative role can leverage local initiatives to become broader regional-wide change and link their communities into 'top-down' opportunities provided by state and federal governments. Local decision-makers must navigate the complexities and uncertainties of these choices, often amid diverse and sometimes conflicting visions for the future.

Australia's regional net-zero circular economy transition must navigate the complexities of global megatrends such as climate change, technological advancement, resource scarcity, and demographic shifts. Regions will need to adapt to rising environmental pressures by embracing renewable energy, sustainable agriculture, and circular practices in industries like mining, manufacturing, and construction. In addition, mitigating pollution through innovative waste and resource recovery initiatives and driving new markets for secondary materials through public procurement will also be critical. However, a major challenge is funding and enabling local innovation, which is often concentrated in cities but needs to occur more in regional areas to ensure a widespread transition. As technological advancements, such as digitalisation and automation, reshape economies, regional areas must build infrastructure and skills to benefit from these innovations while addressing disparities in access and inclusion. Demographic changes, including population ageing and urbanisation, will require strategies to attract younger populations and manage sustainable growth. Ultimately, Australia's regional transition to a circular economy must align with global economic shifts, changing consumer preferences, and the imperative to decarbonise, while ensuring social equity and resilience in local communities.

The six elements of the circular economy

Governance and policy coordination are crucial for driving Australia's circular economy transition, particularly at the regional level. Effective coordination between federal, state, and local governments is needed to align policies, regulations, and incentives that support

circular practices at all scales. This also involves fostering collaboration between public and private sectors, ensuring that policies are tailored to regional contexts, and addressing gaps in infrastructure, funding, and capacity. By creating clear, consistent frameworks and encouraging stakeholder engagement, governance can help scale circular economy initiatives across diverse regions, promoting innovation, resource efficiency, and long-term sustainability.

Several local councils are embarking on a collaborative journey with CSIRO and regional university partners, aiming to align their forward-thinking agenda with cutting-edge scientific insights to tackle complex sustainability challenges. This research collaboration supports initiatives at the regional level in areas such as housing, renewable energy, waste management, and resource recovery, with the goal of accelerating the transition to net-zero emissions and a circular economy in economically viable and socially inclusive ways. These initiatives are tailored to place and people and provide unique opportunities as well as shared learning experiences essential for scaling initiatives both up and out.

A stepwise process for a collaborative approach

The first step in working with local councils is to build trust and legitimacy between the partners and test the alignment of mutual goals before establishing a common purpose for working together. This involves initial meetings with representatives from the councils, CSIRO, and university partners. This meeting is essential for ensuring that all stakeholders are aligned on goals, timelines, and expectations for the collaboration. It serves as the foundation for future work to identify key challenges, set priorities, and establish an agreed-upon structure for communication and decision-making throughout the partnership will be key. A statement of intent or equivalent could be used to confirm intentions to work together.

Once the initial planning is complete, the next step is to **engage the local community through a one-day workshop**. This is an opportunity to bring residents, businesses, and other stakeholders into the conversation, ensuring that the proposed work plans are not only scientifically sound, but also socially inclusive and relevant to the local context. By involving the community early on, the collaboration can shape its purpose on local priorities, build connections and linkages with key stakeholders, and ensure that the initiatives have the backing of those who will be directly impacted.

Following the community workshop, **foundation projects** will be identified and launched to underpin more detailed sustainability planning and prioritising. These initial projects are crucial for demonstrating the viability of circular economy practices at a local level. They also provide an opportunity to test ideas and build momentum for delivering tangible results in areas like renewable energy adoption, waste reduction, and housing innovation.

Foundation projects will address existing issues that can be attended to quickly and typically focus on **circular economy baseline modelling** to identify priorities for further research, investment and policy needs. This baseline analysis serves as a starting point for the local council to transition the region from traditional waste management to a resilient circular economy. It also works to take initiatives beyond cottage industry piecemeal approaches to integrated broader cross regional solutions. Baseline data establishes the foundation for sustainable business practices by conducting a comprehensive material flow analysis and industry mapping and provides the evidence for developing business cases for future investment. These insights will help develop circular business opportunities and business models that promote economic growth and employment while preserving the council's unique environment by reducing waste and enhancing resource efficiency and greenhouse gas abatement. A more detailed visioning and prioritising process along with identifying possible action pathway options and quantitatively assessing each will also form part of the foundation activities providing valuable processes and evidence for decision making. The third element of the foundation activities is to embed a learning and sharing approach into plans going forward. This may

include establishing a local knowledge hub and clearing house for accessing information and sharing valuable learnings.

Finally, the collaboration will move into the development of a formal **scope of work for a 3- to 5-year research partnership**. This work plan will outline the longer-term research agenda, define key deliverables, and establish the necessary resources and timelines for the partnership. By creating a clear and structured framework, the collaboration ensures a sustained and adaptable effort to tackle ongoing sustainability challenges at the regional level, fostering innovation and resilience in local communities.

The scope of work builds on baseline modelling to establish metrics, data, and indicators that support the council's low-carbon circular economy transition and enable effective monitoring and evaluation of its progress. A decision support tool can be developed This approach will help quantify the potential value of a low-carbon circular economy for the region. The focus will include innovation and novel technologies developed to address sustainability challenges, leveraging locally available skills and aligning with scientific advancements in new materials, products, and processes that promote circularity and decarbonisation. This can involve decision support to facilitate the evaluation of circular economy options for by-products from prioritised production systems by providing information on circular applications, techno-economic feasibility, and implementation risks.

Importantly, CSIRO and the local circular economy proponents in council and the broader community can play the role of **transition broker**, aligning community ambition with circular economy outcomes.

Key areas will include design, infrastructure, and locally driven technological innovations, such as industrial clusters, industrial symbiosis, and closed-loop urban industrial systems at the town level. The work will also emphasise the **policies, regulations, markets, investment and financing mechanisms, and business models** needed to turn local experiments and innovations into commercially viable circular or low-carbon enterprises. These efforts will draw on international best practices, strengthen local capacity, and incorporate research insights.

Throughout the foundational and research program, the structure would be co-designed with regional partners to monitor progress, promote reflexive learning to enhance the partnership's ability to navigate complexity and uncertainty and enable cross-learning with other partnering local councils.

Lastly, the work will focus on establishing **local demonstration projects** in collaboration with industry, the council, and the community. These projects will aim to create low-carbon circular economy clusters at the local and regional levels, with support from other councils and the State.

The scope of work will be carried out in collaboration with local stakeholders, integrating scientific expertise as needed, to tackle the opportunities and challenges of transitioning to a low-carbon circular economy. CSIRO will play a key role in facilitating local engagement and guiding the overall strategy. Additionally, CSIRO will establish a platform that allows participating communities to share their experiences and learn from best practices, enabling the scaling up and broadening of the locally established transition management practices.

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