



## circular economy villages co-operative

28 October 2024

Productivity Commission  
Locked Bag 2, Collins St East  
Melbourne Vic 8003

By email: [circular.economy@pc.gov.au](mailto:circular.economy@pc.gov.au)

Dear Sir/ Madam,

### **Inquiry into Opportunities in the Circular Economy**

Thank you for the opportunity to make a submission to the inquiry into opportunities in the circular economy.

The Circular Economy Villages Co-operative (Cevco) is a recently established network of professionals who are collaborating to advance the application of Circular Economy principles to the development of mixed-use (housing and work) neighbourhoods for rural and regional areas. Our activities, described at the website [cevco.life](http://cevco.life), were initiated following the author's doctoral research at The University of Sydney<sup>1</sup>.

Our submission therefore focuses on place-based circular economy activities that can be enabled through urban planning and development.

### **Aims of the Circular Economy**

The academic literature confirms that the Circular Economy remains a highly contested concept, with a 2023 paper<sup>2</sup> analysing 221 definitions. This literature review found that although the aim in nearly 50% of these definitions was 'value maintenance and waste reduction', for more than 30% the principal aim was 'sustainable development'. That is to say, the CE should not be applied in a limited manner to address only issues of waste management and materials productivity, but can be applied more broadly to achieve long term economic and environmental sustainability, as well as increased resilience. As discussed below, this can be achieved by circulating energy, water, and organics for food around a neighbourhood.

**Recommendation 1:** Consider applying the CE to urban planning and development with the aims of achieving increased resilience plus long term economic and environmental sustainability.

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<sup>1</sup> Liaros, S. (2021). *Networks of Circular Economy Villages: Political Economic Principles and Spatial Potentials*. The University of Sydney. <https://ses.library.usyd.edu.au/handle/2123/26675>

<sup>2</sup> Kirchherr, J., Yang, N.-H. N., Schulze-Spüntrup, F., Heerink, M. J., & Hartley, K. (2023). Conceptualizing the Circular Economy (Revisited): An Analysis of 221 Definitions. *Resources, Conservation and Recycling*, 194, 107001-. <https://doi.org/10.1016/j.resconrec.2023.107001>

## CE definition and application to the design of places

The most comprehensive and commonly cited definition of the Circular Economy is from the Ellen Macarthur Foundation (EMF)<sup>3</sup> in the UK, which reads as follows:

*The circular economy is based on three principles, driven by design:*

- *Eliminate waste and pollution*
- *Circulate products and materials (at their highest value)*
- *Regenerate nature*

*Underpinned by a transition to renewable energy and materials, the circular economy is a resilient system that is good for business, people, and the environment.*

The public discourse tends to focus on the first two principles, often neglecting the regeneration of nature. Indeed, this comprehensive definition by EMF offers several useful insights for advancing the CE, particularly in relation to place-based solutions. Although the design of places is usually referred to as 'urban design', we are proposing a solution that is best suited to, and tailored for, rural areas, incorporating food production, so we prefer to use the term 'settlement design'.

**Recommendation 2:** Consider adopting the following Circular Economy settlement design principles for the planning and development of neighbourhoods or new settlements:

1. Adopt a systems-thinking approach to create a resilient system that is good for business, people, and the environment, and therefore strive to simultaneously eliminate waste and pollution, create closed cycles for the circulation of products and materials, while regenerating nature,
2. Incorporate renewable energy generation, storage and distribution systems to power all activities, and
3. Where possible, preference the use and circulation of renewable materials, such as organics, over non-renewables.

In the application of these Circular Economy principles to the development of mixed-use neighbourhoods, Cevco's approach begins with the foundational principle of urban design. That is to say, in designing a place for people, what are the various buildings and infrastructure that this resident population will need? We made the following judgements:

- (a) Consistent with point 1., diverse, mixed-use neighbourhoods are preferable to dormitory suburbs with only housing. This benefits both people and businesses as the creation of work opportunities within walking distance of where people live would create a more liveable and healthier environment, also reducing the stress and cost involved in commuting.
- (b) Consistent with point 2., neighbourhoods should be powered by a renewable energy micro-grid (or embedded network), generating, storing and distributing sufficient energy to satisfy the needs of the resident population. The design of the energy system should consider demand from homes, places of work, as well as electric vehicles.
- (c) Given the regional application and consequent availability of rural land, the mix of uses should include land for a diverse regenerative agricultural system, expanding current concepts of community gardens and urban agriculture, to create a uniquely rural settlement design solution. From a CE perspective, connecting food consumers with food production allows food and agricultural waste to be used directly for improving soils for further food production (point 3.). When there is excessive organic material, this may also be used in a bio-digester to produce biogas and bio-fuels as part of the energy mix.

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<sup>3</sup> <https://www.ellenmacarthurfoundation.org/topics/circular-economy-introduction/overview>

- (d) Critical to regenerating nature (point 1.) is the circulation of water. Reservoirs for storing water and wetlands for cleaning it can be constructed around the rural neighbourhood. In addition to providing water for human consumption, the system can irrigate agriculture, incorporate aquaculture, provide recreation opportunities and cool the environment.
- (e) Adopting a systems perspective (point 1.) we propose to integrate the food, water, and energy systems for maximum efficiency, creating a nature-enhancing infrastructure ecosystem<sup>4</sup>. The multiple functions of the energy system mentioned above could also include pumping water uphill to close the loop in the water cycle. Some of the connections between the water and food systems have already been mentioned, including the intimate relationship between water and healthy soil. A healthy soil holds more water in the landscape which in turn sustains not just microbial life in the soil but supports all life above ground. Finally, the connections between water and energy include moderating temperatures in the environment and in buildings to minimise energy demand, storing energy and potentially also generating energy.

This holistic approach to urban design has informed Cevco's mission statement which reads as follows:

*To facilitate the planning, design and construction of a network of tech-enabled, regenerative villages that strive towards self-sufficiency and zero waste within their bioregion. Each village will house a diverse but discrete community, integrating affordable living and workspaces with a renewable energy micro-grid, a water micro-grid and a regenerative agricultural system.*

## Contrasting Circular Economy Villages with Eco-Industrial Precincts

Attempts to apply the Circular Economy to the development of new precincts often adopt the principles of Industrial Symbiosis in what are referred to as eco-industrial precincts. This relates to the clustering of businesses or industries in such a way that a waste or by-product of one actor becomes a resource for another actor.

While connecting business with each other is an appropriate approach for industry, it is not useful for housing developments. Cevco have adopted the more traditional understanding of circular flow in an economy between businesses and households, proposing the creation of low impact work opportunities close to housing in what would become mixed-use precincts.

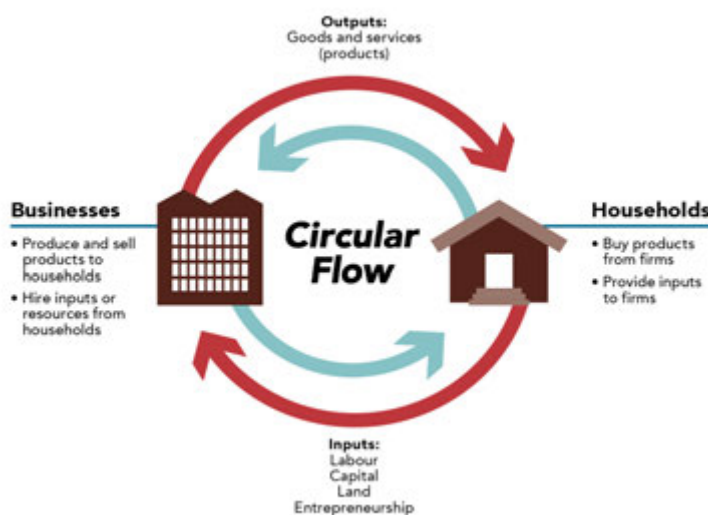


Figure 1 Circular Flow Model. Two-way flow between households and businesses. By Fanshawe College, [CC-BY-NC-SA 4.0](https://creativecommons.org/licenses/by-nc-sa/4.0/)

<sup>4</sup> Liaros, S. & De Silva, N. (2022). Human settlements arranged as networks of regenerative villages with nature-based infrastructure ecosystems. *Civil Engineering and Environmental Systems* 39: 328-346. doi: <https://doi.org/10.1080/10286608.2022.2128341>.

## Implementation

Prior to the establishment of Cevco, the author, as director of town planning consultancy, PolisPlan, had been promoting the CEV concept with various stakeholders in regional Australia. Negotiations with Councils in Bellingen and Armidale have led to the inclusion of enabling actions in their respective Local Housing Strategies. With funding from NSW State Government, Bellingen Shire Council supported the preparation of a comprehensive town planning policy framework for the development of CEVs. The detailed report identified potential sites, and drafted permissibility clauses, standard definitions, draft development controls, infrastructure planning and other policy provisions.

While this policy framework has not yet been adopted by the NSW State Government, the policies have been designed to be readily transferable to other local government areas and even other States. This ensured that they may be negotiated with the State for a specific project in Armidale, which is now our preferred location for a pilot project. The actions in the Armidale Housing Strategy, adopted in August 2024, read as follows:

- *Explore opportunities for the development of new greenfield settlements—based on circular economy and regenerative principles with integrated infrastructure ecosystems—located near or adjoining existing towns and villages.*
- *Explore opportunities to collaborate with UNE and other partners on the development of these new settlements by creating a living lab for research, education, and training.*

### Information request 2 – Priority Opportunities

The potential benefits that could flow from the development of a Network of Circular Economy Villages (CEVs) are significant and align with numerous objectives and priorities of the Australian Government, including the following:

1. The provision of much needed affordable housing adjacent to towns and villages across regional Australia, complementing programs for increasing density in major cities and contributing to the National target of 1.2 million new homes.
2. Expedite the transition to renewable energy by building energy supply in conjunction with housing.
3. Potentially create a network of electric vehicle charging stations across regional Australia by incorporating that capacity into the design of CEVs,
4. Create a network of circular economy, waste-to-resource micro-factories. A significant challenge in the CE is the transport of waste over long distances to a waste management or reuse facility. Some waste streams, particularly organics, some plastics and even glass, may be more readily managed locally. Therefore, a larger network of small-scale waste-to-resource centres, incorporated in CEVs, could assist in improving waste management.
5. Enable the development of a network of biodiverse, regenerative farms. Regenerative agricultural practices have been demonstrated to make a significant contribution to capturing and sequestering carbon dioxide, while regenerating nature. This aligns with and contributes to the government's actions in creating a Nature Repair Market, Carbon Credit Unit Scheme and other Nature Positive Laws.
6. Care for Country and regenerate natural ecosystems within and adjoining the CEVs. The design strategy for developing CEVs, particularly the regeneration of nature, aligns with First Nations cultural responsibilities to Care for Country. Accordingly, this may be a more appropriate strategy for delivering housing to rural and remote communities that empowers them to be more self-reliant to continue cultural practices.

**Recommendation 3:** Support the development of Circular Economy Villages as a means of addressing numerous Australian Government objectives including the delivery of housing, transition to renewable energy, nature repair, and support for First Nations.

## Information request 4 – Governments’ role in the circular economy

It is a matter of significant public interest to advance the CE generally, and particularly to enable CE practices through place-based solutions. This work therefore requires a leadership role by government.

While the work done by Cevco to date provides a solid foundation for the development of Circular Economy Villages, to take the project further requires all three levels of government to participate in the following ways:

- *Local government, in consultation with their communities, would determine how many CEVs could be developed, and in what locations, within their local government area,*
- *The State Governments would play a significant role in issuing regulatory approvals and, where necessary, modifying planning instruments and regulations to enable this form of development,*
- *The States and/or the Commonwealth should also play a role as the lead developer, given that this would preferably be public housing. There would nevertheless be significant opportunities for private delivery partners and service providers,*
- *The Commonwealth could provide the necessary early capital required to develop a minimum viable product (MVP) and stimulate both supply and demand for regional development of this form. This would be complemented by private capital as well as equity from future residents.*
- *The Commonwealth can also develop a National Planning framework for Circular Economy Villages to be adopted by the States, based on principles outlined in recommendation 2 and work already undertaken by Cevco.*

In August 2023, the Commonwealth Government released the Regional Precincts and Partnerships Program. The funding is available until 2026.

*The rPPP seeks to support transformative investment in regional, rural and remote Australia based on the principles of unifying regional places, growing economies and serving communities. Unlike traditional grant programs, the rPPP will focus on a partnership approach, bringing together governments and communities to deliver regional precincts that are tailored to local needs and have a shared vision for how that precinct connects to the region.*

The program offers grant funding in two streams—up to \$5million for precinct planning and up to \$50million for precinct delivery. The grant application should potentially focus on the living lab pilot project in Armidale but should develop a policy framework that can apply in other contexts.

These funds could be applied to a pilot project, potentially in Armidale or alternatively in the two other locations promoting the Circular Economy locally—the Hunter or Bega Valley. Perhaps even all three can be commenced in parallel.

**Recommendation 4:** That the Commonwealth take a leadership role in the development of Circular Economy Villages, providing initial seed capital, taking the role of lead developer and establishing a National Planning Framework for adoption by the States.

## Conclusion

We believe that the development of a Network of Circular Economy Villages, starting with one or more pilot projects in Armidale, the Hunter or Bega, offers the Commonwealth an important opportunity to advance its objectives for the delivery of housing, transition to renewable energy, nature repair, and support for First Nations.

Commonwealth funding is already available that may be applied to this work. Several local governments are interested and engaged in the early steps necessary for delivery. We have not yet formally engaged with the State. This project, and the Commonwealth's own objectives, could be substantially accelerated should it take a leadership role to drive the implementation.

Please contact Dr Steven Liaros if you have any questions or would like more information.

Yours faithfully,

Dr Steven Liaros  
**Director**  
**Cevco**