



Case Study 3: ecologiQ the Victorian state change platform

Report No 1: Identify the strategies to enhance the economic and environmental performance of projects using products with recycled and recyclable content (Case Study 3: ecologiQ the Victorian state change program)

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Executive Summary

Establishing an agency dedicated to centralising efforts to drive the circular economy and enhance the use of products with recycled content (PwRC) in the building and construction sector is critical for transitioning to a circular economy in this sector. Such an agency could serve as a hub for coordinating collaboration, R&D activities, policy reforms and implementation of circular economy principles and practices. Hence, if set up properly, this change agency can drive innovation, collaboration, and sustainability across the sector. Therefore, this report presents the finding of a qualitative research that aimed to understand how the existing change agencies operate to optimise the use of PwRC in construction projects.

Firstly, we analyse a few circular economy change agencies operating across Australia (i.e. Green Industries SA, Waste Authority WA, Sustainability Victoria) and overseas, to provide insights into their performance, and strategies adopted to increase the use of PwRC in construction projects. The findings show that in recent years each of these change agencies have developed a range of innovative strategies to enhance the circular economy, with a focus on waste landfilling diversion.

Secondly, a qualitative case study was conducted using ecologiQ as a successful model of local collaboration to achieve sustainability in the major transport infrastructure construction sector in Victoria. The program, being delivered under the Victorian Infrastructure Delivery Authority, is particularly pushing the state's agenda for using PwRC in the major transport infrastructure sector. The ecologiQ program recently won the Premiers Sustainability Awards 2023, in *Circular Economy Innovation (Industry Leader)* category, recognising its efforts in supporting the state's transition to a circular economy by requiring contractors delivering Victorian major transport projects to optimise their use of recycled and reused materials via the Recycled First Policy. The results show that the program uses six major strategies to influence stakeholders to optimise the use of PwRC in construction projects: 'recycled first policy', 'innovation showcase series', 'knowledge hub', 'speed networking exchange', 'reforms in recycled materials specifications', and 'greener infrastructure conference'.

Lastly, the report outlines a comprehensive set of recommendations designed to significantly augment ecologiQ's capacity to drive the transition to a circular economy within Victoria's major transport infrastructure construction sector. By implementing these recommendations, ecologiQ can enhance its influence, optimise resource efficiency, and further align its efforts with the overarching goals of reducing environmental impact and fostering innovation in the use of PwRC. This strengthened approach will position ecologiQ as a pivotal force in advancing circular economy principles across Victoria's infrastructure projects.

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1 INTRODUCTION

Establishing an agency dedicated to centralising efforts to drive the circular economy and enhance the use of products with recycled content (PwRC) in the building and construction sector is critical for advancing sustainability in this sector. Such an agency could serve as a focal point for coordinating research, development, and implementation of circular economy principles and practices. By bringing together stakeholders from across the sector, including manufacturers, builders, architects, and policymakers, the agency can facilitate collaboration and knowledge sharing, leading to more innovative and sustainable building practices. Additionally, a centralised agency can help set industry standards and guidelines for the use of PwRC, ensuring consistency and quality in construction projects.

Furthermore, an agency focused on the circular economy in the building and construction sector can help address specific challenges and barriers that currently limit the use of these resources. These challenges include issues related to supply chain logistics, quality control, and consumer perception. By providing support and resources to address these challenges, the agency can help increase the adoption of PwRC in construction projects. This, in turn, can lead to significant environmental benefits, such as reduced waste generation and lower carbon emissions. Overall, establishing such an agency can drive innovation, collaboration, and sustainability in the building and construction sector.

This report aims to analyse how ecologiQ, a program being delivered under the Victorian Infrastructure Delivery Authority, has progressed towards influencing stakeholders to enhance the use of PwRC in the state's major transport infrastructure projects. The next section presents the research approach, followed by the findings of the literature review, interviews with key stakeholders and recommendations.

2 RESEARCH APPROACH

2.1 Review of literature

This section of the report presents the research approach employed. First, the research team conducted an extensive literature review to offer insight into leveraging change agencies or programs at the global level (Section 3.1). This is followed by conducting a study analysis of some change agents in Australia (Section 3.2). The cases include Waste Authority in Western Australia, Green Industries SA in South Australia, and Sustainability Victoria, in Victoria. The sources used in this step included journal articles and government and industry reports that are freely available online. Care was taken to only capture the literature that describes the operation of change agents to reflect the current trends and developments.

2.2 Case study and validation

The next phase of this research focused on a qualitative case study analysis of the ecologiQ program, which was established in 2019. This initiative plays a key role in advancing Victoria's circular economy by promoting the use of locally reused and recycled materials while minimising waste in transport infrastructure projects. A variety of secondary sources were analysed to gain a comprehensive understanding of the program's operational model and its impact across the state of Victoria. The case study was subsequently validated through a review by a representative from the Victorian Infrastructure Delivery Authority, ensuring the accuracy and relevance of the findings.

3 LITERATURE REVIEW

This section of the report presents the analytical findings from the literature review, which aimed to shed light on the role of change agents in promoting the adoption of PwRC in construction projects. The analysis is organised into two key subsections: International Perspectives (Section 3.2) and Australian Perspectives (Section 3.3), offering a comprehensive view of global and local practices.

3.1 Platform for change: International perspectives

3.1.1 The UK National Industrial Symbiosis Programme (NISP)

The UK National Industrial Symbiosis Programme (NISP) is a major initiative aimed at improving resource efficiency by promoting collaboration between industries. NISP is the first national industrial symbiosis (IS) programme, that is created by the UK Business Council for Sustainable Development and managed by the nonprofit International Synergies¹. NISP has received recognition for its achievements from bodies including the UN, European Commission, and World Wildlife Fund (WWF).

Launched in 2005, NISP facilitates the exchange of waste, materials, energy, and water between businesses, effectively turning one company's waste into another's resource. This approach, known as IS, fosters a circular economy by reducing waste and minimising the use of raw materials. NISP participants ranged from micro, small, and medium enterprises (SMEs) to large multinational corporations, spanning every sector of industry. This inclusive approach enabled businesses of all sizes to collaborate and exchange resources, fostering innovation and promoting the circular economy across diverse industries. NISP has successfully diverted millions of tonnes of waste from landfills, helping industries repurpose materials and reduce environmental impacts.

One of the key factors behind the programme's exceptional success was its effective management and delivery. The initiative was driven by a nationally coordinated strategy, supported by a local delivery structure. The NISP teams' in-depth knowledge of regional economic and environmental priorities allowed the programme to have a significant positive influence across the UK². This initiative has consistently played a pivotal role in inspiring local, national, and international governments to accelerate their efforts toward enhancing resource efficiency and driving the transition to a circular economy.

According to Castellet-Viciano et al (2022)³, other key elements that have contributed to the success of this IS model include government funding to support the programme, a wide and diverse network of organisations, dedicated professionals focused on maximising the value and extracting optimal benefits from their business interactions, and the existence of a system for managing and exchanging information and data. The initiative operation is based on five major themes as outlined in Figure 1.

¹ Laybourn, P and Lombardi, R (2007) The role of audited benefits in Industrial Symbiosis: The U.K. National Industrial Symbiosis Programme. *Measurement + Control*. 40: 244-247.

² Coralis (2022) NISP: the world's first national industrial symbiosis programme.

³ Castellet-Viciano L, Hernández-Chover V, Bellver-Domingo Á, Hernández-Sancho F. industrial symbiosis: a mechanism to guarantee the implementation of circular economy practices. *Sustainability*. 2022; 14(23):15872.

Delivery	Training	Consultancy	Software	Thought Leadership
<ul style="list-style-type: none"> It is based on the NISP® model ISL has over 1000 IS case studies and reports The benefits include: <ul style="list-style-type: none"> Economic successes (cost savings, revenue generated, investment attracted) Environmental aspects (avoided CO₂ emissions, landfill/waste, water and resource use) Social benefits (jobs created and safeguarded, pollution reduced, training and education) 	<ul style="list-style-type: none"> ISL have devised an extensive capacity building toolkit This includes on-the-ground support and training, how-to guides and systems to support the successful implementation of IS It helps build local capacity and set KPIs It supports local team to identify and progress synergies 	<ul style="list-style-type: none"> ISL enables others to deliver IS projects at local, regional or national level ISL are often engaged by national governments and regional agencies It is based on RED IBIS methodology through which opportunities of IS is recognised in three time-horizons: today (immediate term), tomorrow (medium term) and future (medium-long term) 	<ul style="list-style-type: none"> ISL has pioneered practitioner-informed ICT tools such as SYNERGie® SYNERGie® is a resource matching platform that enables identification and advancement of resource reuse opportunities SYNERGie® software hosts information for over 100,000 resources from 34,000 organisations across 23 countries 	<ul style="list-style-type: none"> Keynote speeches around the world such as G7 Alliance on Resource Efficiency and Global Green Business Summit Thought leadership interviews and publication Expert witness on industrial symbiosis for major institutions including the UN, the EU, World Economic Forum

Figure 1. Major activities performed with the NISP initiative.

International Synergies (ISL) has developed proven industrial symbiosis methodology, tools and systems that can be applied at any scale and in any economy based around the world's first National Industrial Symbiosis Programme.

ISL has developed and implemented the world's leading facilitated industrial symbiosis model (NISP®), based on demand-led engagement with businesses and other organisations. NISP offers a successful blueprint that can be adapted and replicated globally. Since 2007, ISL has exported the NISP model to over 20 countries at both national and regional levels through its capacity-building framework. Furthermore, the organisation has provided strategic consultancy and industrial symbiosis readiness training to more than 10 additional countries, supporting the global adoption of sustainable resource management practices. This international expansion has demonstrated the flexibility and effectiveness of the NISP model in promoting resource efficiency and reducing waste across various economic and environmental contexts.

3.1.2 Platform for Accelerating the Circular Economy (PACE)

Platform for Accelerating the Circular Economy (PACE)⁴ is a global initiative aimed at promoting the circular economy by bringing together governments, businesses, and civil society organisations to collaborate and scale solutions that advance resource efficiency and sustainability. PACE was created in 2018 by the World Economic Forum and is now hosted by the World Resources Institute. PACE is facilitated by a full-time team in The Hague, Netherlands.

PACE is co-chaired by a group of global leaders, including government representatives and CEOs of multinational corporations such as Apple, SYSTEMIQ and IKEA. It also receives support from the World Economic Forum, which plays a key role in the platform's operations and outreach. PACE serves as a hub for sharing best practices, research, and data to help industries and governments adopt circular models. It provides toolkits, case studies, and policy recommendations to promote circular economy transitions globally.

The PACE current programs are informed by three priority areas to improve environmental quality, economic development, and social equity at the local, regional and country levels. These priority areas are illustrated in Figure 2.

⁴ PACE (2024) Platform for Accelerating the Circular Economy. Accessed via <https://bit.ly/4dSLW4j>



Figure 2. PACE's three priority areas. Source: PACE (2024)⁴

PACE works with governments to set ambitious circular economy targets and align policy with circular practices. For example, it supports countries in developing national strategies for circularity and sustainable development. In order to address the above-mentioned priority areas, PACE programs follow a process that involves four major stages. These include background analysis, stakeholder analysis, running workshops and developing actionable recommendations (Figure 3).



Figure 3. Schematic overview of the PACE process. Source: PACE (2024)⁴

In alignment with Stage 4 (Outcomes), PACE has developed action agendas for specific industries, providing roadmaps to accelerate circular economy practices. These agendas focus on crucial sectors like electronics, plastics, and capital equipment. PACE's strategy focuses on three activity pillars: Leadership, Learning and Projects. The pillars closely interact with one another to implement and scale circular approaches.

Table 1. PACE's three activity pillars

Activity pillar	Description
Leadership	<ul style="list-style-type: none"> PACE brings together a global leadership group dedicated to advancing the circular economy. This group collaborates to address specific obstacles that hinder progress. They pilot innovative projects and scale up successful practices to achieve a greater impact on sustainability efforts.
Learning	<ul style="list-style-type: none"> PACE gathers and translates insights from its projects into frameworks and methods that can be replicated. Knowledge is generated through mapping exercises across different thematic areas. PACE facilitates cross-learning between projects to ensure lessons are shared widely. These approaches are disseminated within the PACE community to guide leadership decisions. The goal is to better enable the scaling of circular economy solutions by using these replicable models and shared learnings
Projects	<ul style="list-style-type: none"> PACE initiates and accelerates new projects, while also helping partner-led initiatives scale circular economy efforts. Focus areas include plastics, electronics and capital equipment, food and agriculture, and textiles and fashion. Other thematic priorities involve Finance, Metrics, and Innovation to support the transition. Active projects are being implemented across multiple regions, including Asia, Africa, Latin America, and Europe, showcasing the global reach of PACE's initiatives.

3.2 A platform for positive change: Australian perspectives

In Australia, the waste is primarily regulated at the state level. The direction of change towards a circular economy and the use of PwRC in the building and construction sector is informed by the state Waste Strategy document⁵. In each state, the use of PwRC is promoted through several state agencies. However, in recent years, in line with increased awareness of waste management and the circular economy movements, some states have established centralised entities to transform waste management from a linear approach to a more circular one. These change agencies are typically the products of partnerships between different public organisations and in some cases private sectors. Figure 4 illustrates four change agents in four Australian states. In this section, the performance of these change agents is reviewed.

⁵ Shooshtarian S, Maqsood T, Khalfan M, Wong PSP and RJ Yang (2020) 'Review of waste strategy documents in Australia: analysis of strategies for construction and demolition waste'. *International Journal of Environmental Technology and Management*. 23(1): 1-21.



Figure 4. Australian states change agencies for optimal uptake of PwRC

3.2.1 Waste Authority

Waste Authority is a government agency that works with local government, regional councils, stakeholder groups, the waste management sector and the community to promote understanding of resource recovery. The organisation uses four major initiatives to increase the use of PwRC in construction projects. As outlined in Figure 5, these initiatives include ‘Waste Strategy Action Plans’, ‘Waste Forum’, ‘Waste Data Portal’ and ‘WasteSorted Program’.

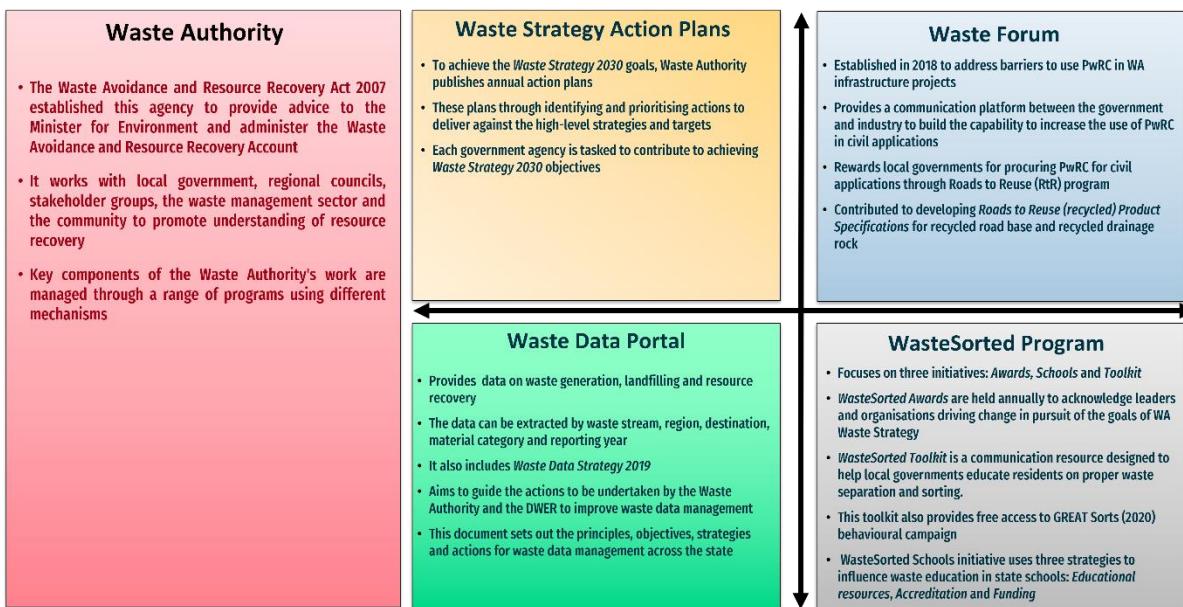


Figure 5. Waste Authority's major initiatives to enhance the use of PwRC in construction

1) Waste Strategy Action Plans

In Western Australia, Waste Recovery and Resource Strategy is the overarching policy that drives the change in the C&D waste space. The state Department of Water and Environmental Regulation (DWER) is responsible for developing the policy in consultation with the Waste Authority and Main Roads Western Australia. The policy has been able to push the agenda of using PwRC at the state level. The policy is the foundation of the Waste Strategy 2030 document, which outlines the WA government mechanism for defining waste management-related actions.

To achieve the Waste Strategy 2030 goals, Waste Authority publishes annual action plans. These plans through identifying and prioritising actions to deliver against the high-level strategies and targets. They

are prepared with input from State Government agencies to support the Waste Strategy. According to the organisation's webpage⁶, several action plans are used for this purpose. In Action Plan 2022-23, eight strategies are outlined to achieve Waste Strategy 2030 goals. These are summarised in Table 2.

Table 2. Headline strategies outlined in Action Plan 2022-23

Strategy	Description
1	Develop statewide communications to support consistent messaging on waste avoidance, resource recovery and appropriate waste disposal behaviours
2	A consistent three-bin kerbside collection system, which includes the separation of food organics and garden organics from other waste categories
3	Implement sustainable government procurement practices that encourage greater use of recycled products and support local market development.
4	Implement local government waste plans, which align local government waste planning processes with the waste strategy.
5	Review the scope and application of the waste levy to ensure it meets the objectives of the waste strategy and establish a schedule of future waste levy rates
6	Undertake a strategic review of WA's waste infrastructure (including landfills) to guide future infrastructure development.
7	Review and update data collection and reporting systems to allow waste generation, recovery and disposal performance to be assessed in a timely manner.
8	Provide funding to promote the recovery of more value and resources from waste with an emphasis on focus materials.

In Waste Authority Business and Action Plan 2024–25, the most updated action plan developed by Waste Authority, each government agency is tasked to contribute to meeting Waste Strategy 2023. For instance, in Strategy No.3 (Table 2), the use of PwRC is requested from the Waste Authority, Department of Finance, Department of Communities, Department of Local Government, Sport and Cultural Industries, and Main Roads Western Australia.

2) Waste Forum

In Western Australia, the actions are defined in a platform called Waste Forum which was established in 2018. The Forum consists of *DWER*, *Waste Authority* and *MainRoads WA* representatives, as well as experts in the waste and recycling industry. Other parties involved include *Tyre Stewardship Australia*, the *Waste and Recycling Industry Association of Western Australia*, and the *State Department of Health and Finance*. The Waste Forum initiative has been the facilitator in addressing the long-standing impediments inhibiting the use of PwRC in WA infrastructure projects. This multi-disciplinary sustainability group has delivered outstanding outcomes through a commitment to innovation and collaboration. The platform allows the latter group to project manage the whole process to ensure that upcoming challenges as identified by them are dealt with appropriately.

One of the main policy-based actions for implementing sustainable procurement is to develop and improve recycled product specifications. In 2021, the forum contributed to developing Roads to Reuse Product Specifications that target recycled road-based and recycled drainage rock⁷.

The Waste Forum also provides a communication platform between the government and industry to build the capability to decide on strategies to evaluate product specifications for PwRC. The platform

⁶ Waste Authority (2023). Action Plans. Accessed via <https://bit.ly/3yNQc6R>

⁷ Government of Western Australia (2021). Roads to reuse product specifications. Accessed via <https://bit.ly/3TaZPn4>

brings together recycling businesses to promote and make the product specifications known to all parties involved in the recycled cornet supply chain. The Forum, in collaboration with the industry in the network, periodically facilitates training courses to educate the stakeholders about the requirements of PwRC. Such networking has enabled government organisations to connect to other waste groups, such as the Infrastructure Sustainability Council (ISC) WA Working Group, to capture the issues from a holistic perspective better.

Lastly, this platform worked with the state agencies to develop an incentive program called Roads to Reuse (RtR). The scheme provides a payment of \$5 for each tonne of RtR product sourced from an accredited RtR supplier (Figure 6). The program budget for 2022–23 was \$350,000. Payments will be made to local governments on a ‘first come, first served’ basis until the budget is exhausted.



Figure 6. Outline of RtR incentives mechanism.

Source: Waste Authority (2024)⁸

To date, Main Roads has used over 100,000 tonnes of PwRC in projects⁹ such as Kwinana Freeway widening, Leach Highway and Welshpool Road Interchange, and Tonkin Gap, and is committed to significantly increasing their utilisation in future. This program also provides a list of accredited PwRC suppliers (recyclers) across the state. Currently, the list consists of four recycling companies.

3) Waste Data Portal

This online portal provides data on waste generation, landfilling and resource recovery. The portal through its interactive data dashboards allows one to select a combination of waste and recycling data that is of interest. The filters that can be used to navigate waste data include waste stream, region, destination, material category and reporting year.

This portal also includes the Waste Data Strategy 2019¹⁰ which aims to guide the actions to be undertaken by the Waste Authority and the DWER to improve waste data management in WA and to ensure that the waste data needs of stakeholders are met. This document sets out the principles, objectives, strategies and actions for waste data management across the state. The document is reviewed about every five years, in line with the legislated review of the Waste Strategy.

4) Waste Sorted Programs

This program focuses on three initiatives: *Awards*, *Schools* and *Toolkit*. The WasteSorted Awards are held annually and acknowledge exceptional leaders and organisations driving change in pursuit of the goals of Western Australia's Waste Strategy. The awards celebrate those making landfills the last resort by avoiding, reusing, repairing and recycling waste and inspiring others to follow in their footsteps. In

⁸ Waste Authority (2024) Roads to Reuse Local Government Incentives Program. Accessed via <https://bit.ly/3MpMsLV>

⁹ Waste Authority (2024) Roads to Reuse: Promoting the use of recycled construction and demolition (C&D) products. Accessed via <https://bit.ly/3vTE44d>

¹⁰ Waste Authority (2019) Waste Data Strategy. Accessed via <https://bit.ly/478kg0M>

2024, the award program¹¹ consisted of ten categories to target individuals, business and industry, government, schools, community organisations and not-for-profits.

WasteSorted toolkit is a communication resource developed to help local governments communicate with their residents on the importance of separating their waste and sorting it correctly to reduce contamination in their kerbside bin services. This source provides free access to a range of promotional content¹² such as templates and graphic elements, social media and videos, banners and displays for community events. Furthermore, an effective initiative under this program is the *GREAT Sorts* behavioural campaign. It was launched in 2020 and uses behavioural economics research and strategies developed locally for WA. The campaign development incorporates extensive consumer research and message testing to identify and prioritise waste sorting behaviours with the most potential to reduce household waste and increase recovery rates.

The WasteSorted Schools¹³ initiative uses three strategies to influence waste education in state schools. It provides waste educational resources for WA schools, accredits schools with a waste education focus and provides funding to assist accredited schools in waste management and education. WasteSorted Schools has a wide variety of resources to help schools implement waste minimisation projects. The list of these resources is outlined in Figure 7.

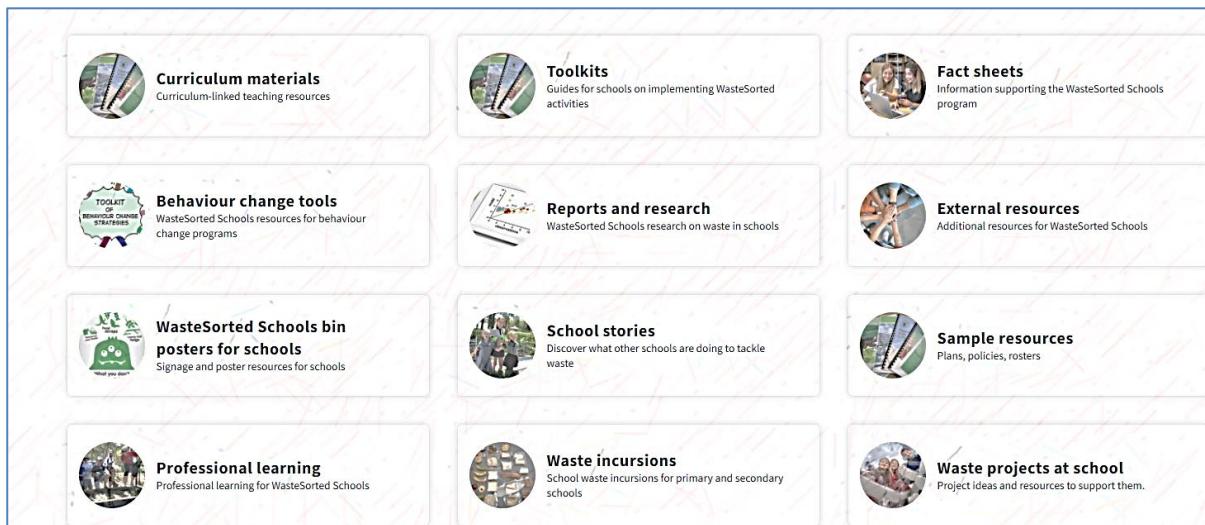


Figure 7. The educational resources provided through the WasteSorted WA Schools program

3.2.2 Green Industries SA

Green Industries SA (GISA) is an enabler and driver of change, supporting the development of the circular economy in South Australia. This government agency was established in 2015 under the Green Industries SA Act 2004¹⁴ and replaced Zero Waste SA. This change agent strives to improve productivity, resilience, resource efficiency and the environment through diverse collaborations and partnerships¹⁵. GISA has outlined its strategic priorities through GISA Strategic Plan 2021-2025¹⁶. This strategic plan outlines how South Australia can ensure a sustainable future while maintaining a thriving economy. Green Industries SA's five strategic priorities will focus on Circular products and services, Circular consumption, Circular resource recovery, Circular sectors and Circular capacity over the next five years. This agency offers a range of initiatives that help the state transition to a circular economy and achieve its five strategic priorities (Figure 8).

¹¹ Western Australia Government (2024). Finalists announced for 2024. Accessed via <https://bit.ly/3X7mx0k>

¹² Local Government Areas Western Australia (2023) WasteSorted: a toolkit for local governments and regional councils Accessed via <https://bit.ly/4g3MvdJ>

¹³ Waste Authority (2023). WasteSorted Schools. Accessed via <https://www.wasteauthority.wa.gov.au/wss/>

¹⁴ South Australia Government (2024) Green Industries SA Act 2004. Accessed via <https://bit.ly/4fyU05L>

¹⁵ GISA (2024) Circular Economy Knowledge Hub. Accessed via <https://www.greenindustries.sa.gov.au/>

¹⁶ GISA (2021) Green Industries Strategic Plan 2021-2025. Accessed via <https://bit.ly/3YXetSx>

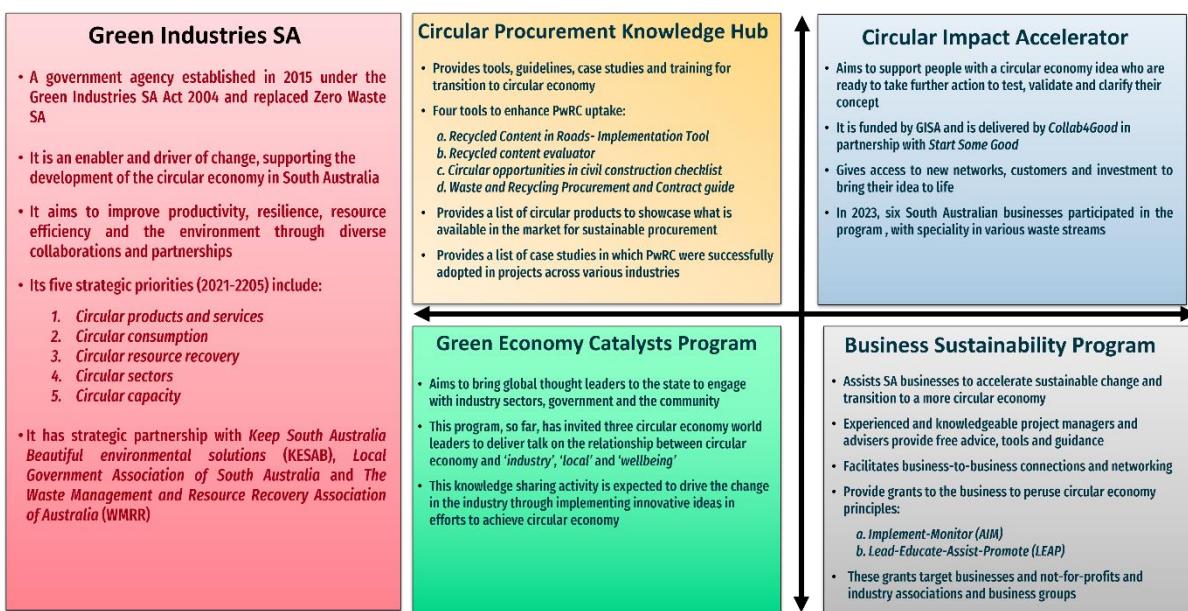


Figure 8. GISA initiatives in circular economy space

1) Circular Procurement Knowledge Hub

One of the relevant initiatives led by this organisation is the Circular Procurement Knowledge Hub. This Hub provides tools, guidelines, case studies and training that will help incorporate circular economy principles into procurement and achieve sustainability goals.

This hub provides four tools that together assist businesses operating across the state in the effective utilisation of PwRC. The first tool is the *Recycled Content in Roads- Implementation Tool*. This implementation tool has been developed to provide a clear pathway for the use of recycled material in infrastructure, in an environmentally safe and responsible way. It is aimed at all levels of local government, including elected members, executives, procurement teams, sustainability officers, asset managers and engineers to help them understand the PwRC options available for inclusion in local roads, and allow them to specify their use with greater confidence. This tool- which was supported by GISA- was developed by the Australian Road Research Board in consultation with the Institute of Public Works Engineering Australasia, the City of Mitcham, the City of Burnside, the Port Pirie Regional Council, and the Adelaide Hills Council. The content of this tool is provided in Table 3.

Table 3. Structure of *Recycled Content in Roads- Implementation Tool*

Content	Description
Recycled material information	Common PwRC with proven performance in road networks, and their relevant applications and specifications
Life cycle assessments	Results from LCAs on innovative pavement designs incorporating PwRC
Environmental pathways	Environmental regulatory pathways, potential barriers to use, and compliance and mitigation measures for the use of PwRC
Implementation framework¹⁷	Key steps to design and execute field trials for incorporating PwRC in road construction

The second tool is the *Recycled Content Evaluator* which is designed to assist with the evaluation of quotes and proposals during a procurement process, making it easier to include PwRC as part of the evaluation criteria. Responses to each of the questions in the evaluator should be requested from potential suppliers as part of the tender process. The results of this tool can be extracted for inclusion

¹⁷ ARRB (2022). Development of an Assessment and Implementation Framework for the Use of Recycled Materials in South Australian Road Network Project. Prepared for GISA. Accessed via <https://bit.ly/4dCCKLG>

in procurement documentation. This tool was adapted from the Local Government Area (LGA) of SA Buying it Back project outputs.

The third tool is the *Circular Opportunities in Civil Construction Checklist*¹⁸, which was developed by the Department for Infrastructure and Transport's Regency to Pym Street project, and provides a checklist to easily identify circular opportunities in civil construction projects.

The fourth tool is the *Waste and Recycling Procurement and Contract Guide*¹⁹. It provides information on how and when to consider changes to waste and recycling collection services and contracts, and guidance on preparing tender documents that encourage positive financial, contractual and environmental outcomes.

This hub also provides a list of products that are deemed to be circular. This list aims to showcase what is available in the market for sustainable procurement. For instance, in the construction tab, eight products materials and products are introduced. These include aggregates, bitumen, bridges, cement and concrete, pavements and footpaths, walls, kerbs and edging, water and drainage. GISA invites businesses operating in circular manufacturing and supplying across the state to add their circular products to the list.

Lastly, GISA showcases a list of case studies with sustainability achievements. Some of these case studies successfully utilised PwRC in their projects. These case studies cover a range of industries including construction, textile, food and agriculture.

2) Circular Impact Accelerator

This initiative is funded by GISA and is delivered by Collab4Good in partnership with Start Some Good. It aims to support people with a circular economy idea who are ready to take further action to test, validate and clarify their concept, while also gaining access to new networks, customers and investment to bring their idea to life. In 2023, six South Australian businesses participated in the program²⁰, with a specialty in various waste streams.

3) Green Economy Catalyst Program

This program aims to bring global thought leaders to the state to engage with industry sectors, government and the community, to support SA's transition to a circular economy and take advantage of the economic growth opportunities. Thus far, this program has invited three circular economy world leaders to deliver a talk on the relationship between circular economy and industry, local and well-being. The knowledge shared by these experts is expected to drive change in the industry through implementing innovative ideas to increase the impacts and achieve sustainability goals while transitioning to a circular economy.

4) Business Sustainability Program²¹

This program assists South Australian businesses and industry sectors to accelerate sustainable change and transition to a more circular economy. By identifying and prioritising better practice materials and resource efficiency, waste management and resource recovery, and implementing circular economy principles, participants in this program can improve profitability, productivity, and environmental performance. Through this program, experienced and knowledgeable project managers and advisers provide free advice, tools and guidance. It also facilitates business-to-business connections and networking. Part of this program is to provide grants to businesses to peruse circular economy principles. Currently, two categories of grants target businesses and not-for-profits (*Assess-Implement-*

¹⁸ GISA (2022). Circular opportunities in civil construction checklist. Accessed via <https://bit.ly/3AD4oQq>

¹⁹ GISA (2024). Waste and Recycling Procurement and Contracts. Accessed via <https://bit.ly/4c1Ip7s>

²⁰ GISA (2024) Circular impact accelerator. Accessed via <https://bit.ly/3MoEmmE>

²¹ GISA (2024) Business Sustainability Program. Accessed via <https://bit.ly/4clhk58>

Monitor (AIM) Grants), and industry associations and business groups (Lead-Educate-Assist-Promote (LEAP Grants).

3.2.3 Sustainability Victoria

Established in 2005, under the Sustainability Victoria Act 2005, Sustainability Victoria is a statutory authority with a board appointed by the Minister for Energy, Environment, and Climate Change Action. Its primary objective is to drive Victoria's transition to a circular, climate-resilient, and clean economy²², aligning with the government's targets for 2025 and 2030 as outlined in the Recycling Victoria policy and the Climate Change Strategy. According to the *Sustainability Victoria Strategic Plan 2024-2027*²², this agency is a circular economy transition broker with the intent of reducing or stopping waste before it starts, in every part of the system. The agency's vision is to position Victoria as the leading circular economy state in Australia by 2027.

The agency's latest document, SV Strategic Plan 2024-2027²², outlines the major priorities towards achieving a circular economy. These include 'Investment & Innovation', 'Behaviour Change & Education', and 'Community Action'. Sustainability Victoria collaborates with a wide array of stakeholders, including industry partners businesses, entrepreneurs, research institutions, schools, households, individuals, community groups, and government agencies within Victoria and across Australia. By fostering these partnerships, Sustainability Victoria aims to develop and deliver impactful solutions that are tailored to meet the specific needs of each sector, contributing to the broader goals of sustainability. Sustainability Victoria closely works with ecologiQ to enhance the uptake of PwRC in the state's major transport infrastructure construction sector. This agency uses various strategies and initiatives to support the state's transition to a circular economy. Figure 9 presents these strategies:

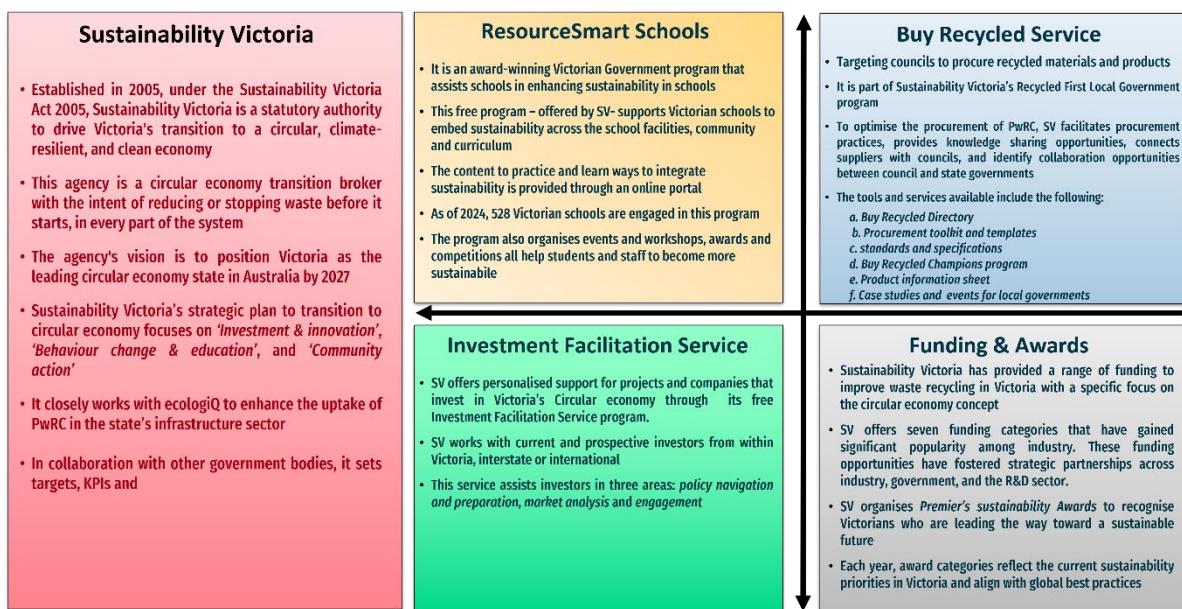


Figure 9. Sustainability Victoria initiatives in Circular Economy space

1) ResourceSmart Schools

ResourceSmart Schools is an award-winning Victorian Government program that assists schools in embedding sustainability in everything they do. This free program is offered by Sustainability Victoria and supports Victorian schools to embed sustainability across the school facilities, community and curriculum while saving resources and money for the school²³. Schools join the program and then have access to an online portal (ResourceSmart Schools online), where they learn and practice ways to integrate sustainability. SV has engaged hundreds of Victorian schools in sustainability through

²² Sustainability Victoria (2024) Strategic Plan 2024-2027. Accessed via <https://bit.ly/4g96Uvk>

²³ Sustainability Victoria (2024) ResourceSmart Schools modules. Accessed via <https://bit.ly/47kQUFw>

ResourceSmart Schools, with 528 currently engaged²². The program also organises events and workshops, awards and competitions. Through their 'waste module,' schools learn how to implement operational practices focused on reducing, reusing, and recycling to minimise waste sent to landfill.

2) Buy Recycled Service

The Buy Recycled Service and dedicated team work with councils to encourage more use of PwRC in infrastructure, landscaping, parks and gardens. This service is part of Sustainability Victoria's Recycled First Local Government program. Under this program, SV provides several services including facilitating procurement practices, knowledge sharing, connecting suppliers with councils, and identification of collaboration between council and state governments to optimise the procurement of PwRC. Table 4 presents the tools and resources available through this program.

Table 4. Tools and resources available through Buy Recycled Service

Tool/resource	Aim
Buy Recycled Directory	lists PwRC to provide buyers with easy access to suppliers and product options.
Procurement toolkit and templates	The Buy Recycled Procurement Toolkit ²⁴ and templates provide practical guidance to council officers seeking to procure recycled products and materials for infrastructure, landscaping, parks and gardens.
Standards and specifications	Standards and specifications outlining the characteristics of PwRC required for application in civil applications
Case studies and news	Content about councils who have used PwRC in their projects
Product information sheet	An overview of PwRC for councils considering their use in infrastructure, landscaping, parks and gardens.
Events for local governments	Provides learning from local government project managers who are enabling the circular economy through buying recycled and sustainable procurement.
Buy Recycled Champions program	Through this initiative, Champions are empowered to embed sustainable procurement practices as business as usual at their councils and provide participants with opportunities to build capacity, influence, network and share successes within their own councils and beyond.

3) Investment Facilitation Services

Sustainability Victoria offers personalised support for projects and companies that invest in Victoria's Circular economy through its free Investment Facilitation Service program. SV works with current and prospective investors from within Victoria, interstate or international²⁵. To provide investors with a comprehensive level of service, SV coordinates across government including investment specialists within the Department of Jobs, Skills, Industry and Regions (DJSIR) and Invest Victoria for overseas companies looking to set up operations in Victoria for the first time. This service assists investors in three main areas: *Policy navigation and preparation*, *Market analysis* and *Engagement* (Table 5).

²⁴ Sustainability Victoria (2022) Recycled products and materials procurement toolkit for local government. Accessed via <https://bit.ly/3Tk9K9R>

²⁵ Sustainability Victoria (2023) Assistance with investing in Victoria's emerging Circular economy. Accessed via <https://bit.ly/3TbceY4>

Table 5. The structure of SV's Investment Facilitation Service program

Policy navigation and Market analysis preparation		Engagement
Help you navigate the government's policy direction and its priorities	Provide information and market insight on waste and resource streams	Advise on how to engage with local communities
Inform you of environmental requirements and potential risks	Provide insight on the status and development of local end markets	connect the investors with research institutions and potential partners
Offer business case development support		Identify potential financial and non-financial support
Identify suitable sites for your project and navigate approval processes		

4) Funding and awards

Since 2021, Sustainability Victoria has provided a range of funding to improve waste recycling in Victoria with a specific focus on the circular economy concept. So far, the agency has offered seven funding categories that have gained significant popularity among industry, government, and research institutions (Table 6). These funding opportunities have fostered strategic partnerships across industry, government, and the R&D sector.

Furthermore, Sustainability Victoria organises the annual Premier's Sustainability Awards to recognise Victorians who are leading the way toward a sustainable future. Each year, the award categories reflect the current sustainability priorities in Victoria and align with global best practices. The latest awards round in 2024 includes categories such as Circular Economy Innovation.

Table 6. The categories of SV's funding and awards.

Premier's Sustainability Awards categories	Funding and grant categories
1) Circular economy innovation	1) Innovation
2) Future energy	2) Business support
3) A healthy and fair society	3) Communities
4) Sustainable places	4) Research and development: materials
5) Thriving environment	5) Waste to Energy
6) Waste and recycling solutions	6) Household education
	7) Recycling modernisation fund

3.2.4 Office of Environment and Heritage NSW

The Office of Environment and Heritage (OEH) was formed in 2011 and is now part of the NSW Department of Climate Change, Energy, the Environment and Water. This public agency worked with communities, businesses and governments to protect, preserve and strengthen the quality of NSW's natural environment and heritage. OEH is responsible for delivering the state outcome 'connecting communities to resilient and sustainable environments and heritage.'

The OEH in NSW is actively involved in promoting the use of recycled materials through various initiatives, policies and programs aimed at enhancing resource recovery and supporting sustainable practices. These activities are captured in Figure 10.

Policy	Remanufacture NSW	Sustainable Procurement	NABERS Waste tool
<ul style="list-style-type: none"> OEH delivered the NSW Government Resource Efficiency Policy (GREP) The GREP contains actions, targets and minimum standards for resource efficiency in government operations. 	<ul style="list-style-type: none"> Focuses on co-funding infrastructure and trials to bolster the state's resource recovery sector It has two funding streams: Infrastructure and trials The EPA provided a free application advisory service (AAS) to support eligible applicants to prepare their grant applications 	<ul style="list-style-type: none"> The OEH advocates for sustainable procurement practices among government agencies OEH aims to encourage an increase in the use of PwRC and environmentally preferable materials in public contracts Collaborated with Local Government NSW (LGNSW) to develop a Sustainable Procurement Guide 	<ul style="list-style-type: none"> The OEH contributed to creating NABERS Waste NABERS Waste is a national rating system designed to measure and improve the waste management performance of Australian buildings and tenancies Since its inception, NABERS has expanded beyond Australia, with adaptations launched in New Zealand and the UK

Figure 10. The main OEH's activities concerning the use of PwRC

1) Policy development

OEH delivered the NSW Government Resource Efficiency Policy (GREP) through the former Cluster Corporate Services (CCS) Sustainability Program. The GREP contains actions, targets and minimum standards for resource efficiency in NSW government operations.

2) Remanufacture NSW

One of the key programs is Remanufacture NSW²⁶, which focuses on co-funding infrastructure and trials to bolster the state's resource recovery sector. This program was developed in response to Australia's waste export bans and aims to increase recycling and reuse activities while keeping materials within the economy. Remanufacture NSW is jointly funded by the Australian Government's Recycling Modernisation Fund and the NSW Government's Waste Less, Recycle More initiative. The grant program is delivered by the NSW Environmental Trust in partnership with the NSW EPA.

The initiative specifically targets materials like plastics, paper, cardboard, and tyres, supporting projects that enhance recycling infrastructure and develop new processing technologies. Remanufacture NSW had 2 streams: infrastructure and trials. Under Stream 1 Grants are available for establishing new recycling facilities, improving sorting and cleaning technologies, and increasing processing capacities for various recyclable materials. Under Stream 2, Funding is also allocated for innovative trials that aim to improve the use of PwRC in manufacturing and construction. This includes testing new methodologies, technologies, and processes to increase the quality and marketability of PwRC.

3) Sustainable procurement

The OEH advocates for sustainable procurement practices among government agencies to increase the use of recycled and environmentally preferable materials in public contracts. One significant effort in this space is the collaboration with Local Government NSW (LGNSW) to develop a Sustainable Procurement Guide²⁷. This guide helps councils maximize their purchasing power—over \$10 billion annually—by encouraging them to adopt sustainable practices that benefit both the environment and the economy. This partnership has focused on training, capacity building, and developing best practices to embed sustainable procurement into the daily operations of local councils.

²⁶ NSW Government (2018). Remanufacture NSW. Accessed via <https://bit.ly/40w4415>

²⁷ LGNSW (2017) Sustainable procurement guide for local government in NSW. Accessed via <https://bit.ly/3UIRKNE>

Additionally, OEH was instrumental in the launch of the Sustainable Procurement ISO 20400, the first international standard for sustainable procurement. This standard serves as a framework to help organizations implement sustainable procurement strategies effectively.

4) NABERS Waste

The National Australian Built Environment Rating System (NABERS) was developed in NSW, starting in 1999. Its creation was driven by the NSW government, specifically through the OEH, in collaboration with various stakeholders, including the property industry and sustainability experts. Since its inception, NABERS has expanded beyond Australia, with adaptations launched in New Zealand and the UK, demonstrating its influence in promoting sustainable practices globally. The program encourages building owners and tenants to enhance their operational efficiencies and minimize their environmental impact by providing transparent performance ratings.

NABERS Waste is part of a broader initiative to encourage and recognise sustainable practices in building management. It focuses on assessing the volume of waste generated, the effectiveness of recycling practices, and the overall waste management strategies employed by properties. The system not only provides a rating but also guides building managers and operators on how to improve their waste management practices. This can include implementing better recycling systems or reducing overall waste generation.

4 CASE STUDY: ECOLOGIQ

4.1 Background

The ecologiQ program was initiated in 2019 by Allen Garner, the CEO of Major Road Projects Victoria. Garner recognised the critical link between Victoria's transport projects and the need for reform in the state's waste recovery system. His pioneering vision laid the foundation for ecologiQ's efforts to drive sustainability and innovation in Victoria's major transport infrastructure projects. The four main objectives of this program are as follows²⁸:

- Contribute to a Victorian circular economy by increasing the use of Victorian reused and recycled materials, and reducing waste in transport infrastructure construction
- Encourage innovation in transport infrastructure construction to improve quality and accelerate the implementation of new Victorian recycled products
- Support a vibrant and sustainable Victorian market for reused and recycled materials in transport infrastructure construction
- Reduce, re-use and recycle materials without compromising the delivery of safe, high-quality and sustainable infrastructure

A significant catalyst for this transformation is the Recycled First Policy, a groundbreaking initiative in Australian history. This policy mandates that contractors involved in Victorian transport projects optimise the use of recycled and reused materials, marking a crucial step towards sustainable construction practices in the region. Since the policy was implemented in 2020, more than 4.5 million tonnes of recycled materials have been delivered across 46 projects – more than enough to fill the Melbourne Cricket Ground. In 2023, the ecologiQ program was the winner of Victoria's Premiers' Sustainability Award in the category of Circular Economy Innovation²⁹ for its efforts to drive greater use of PwRC in transport infrastructure projects.

4.2 Change strategies

ecologiQ has implemented a variety of strategies to promote the adoption of PwRC in state major transport infrastructure construction projects. These strategies have been developed in collaboration with key state agencies such as Sustainability Victoria, Recycling Victoria, the Department of Transport and Planning, and Victoria's Big Build project offices, as well as various industries involved in C&D waste management. Figure 11 provides a visual representation of these strategies, highlighting the comprehensive approach taken by ecologiQ to drive positive change in the industry.

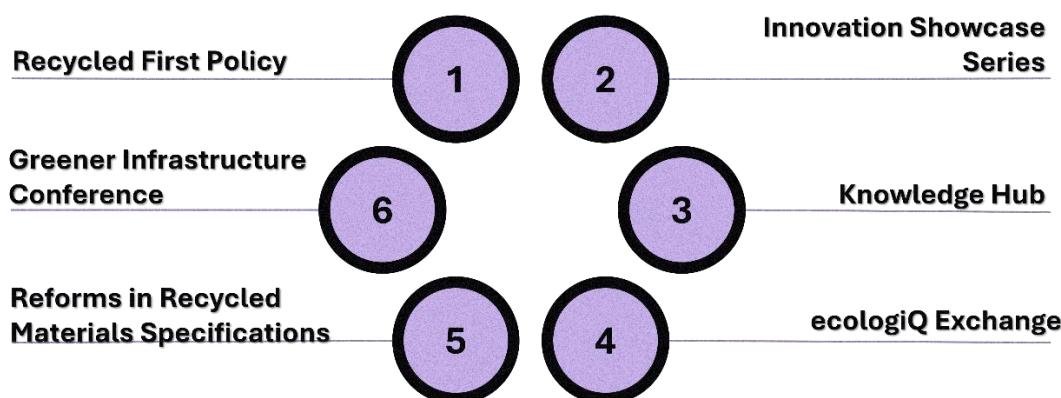


Figure 11. ecologiQ change strategies to optimise the use of PwRC in major transport infrastructure projects

²⁸ Victoria Big Build (2023) About ecologiQ. Available from <https://shorturl.at/xEHMO>

²⁹ Sustainability Victoria (2023) ecologiQ: 2023 Winner – Circular economy innovation. Available from <https://shorturl.at/gswIM>

Recycled First Policy³⁰—The Recycled First Policy aligns with the Victorian Government's Circular Economy Strategy, Recycling Victoria: A New Economy³¹, a 10-year plan to revamp the state's recycling sector, enhance domestic recycling capabilities, and drive innovation. Under this policy, since March 2020, all bidders for major transport projects in Victoria must demonstrate in their proposals through a Recycled First Plan how they will optimise the use of PwRC within the constraints of existing standards and specifications to build roads, railways and other major transport infrastructure. The delivery agencies mainly include the Victorian Infrastructure Delivery Authority (VIDA) and the Suburban Rail Loop Authority (SRLA). ecologiQ facilitates the implementation of the Recycled First Policy, and thus PwRC, into Victoria's major transport infrastructure construction projects, including collating and analysing data from projects to identify PwRC use, barriers and learnings, then acting on and communicating these insights to delivery partners. The policy also has the potential to be extended to other projects, operational activities, and maintenance tasks undertaken by various State Government departments and agencies.

Innovation Showcase Series – The ecologiQ Innovation Showcase series gives Victorian industry and their research partners the chance to pitch ideas and products that can help transition Victoria towards a waste-free, low-carbon, climate-resilient future (Figure 12).

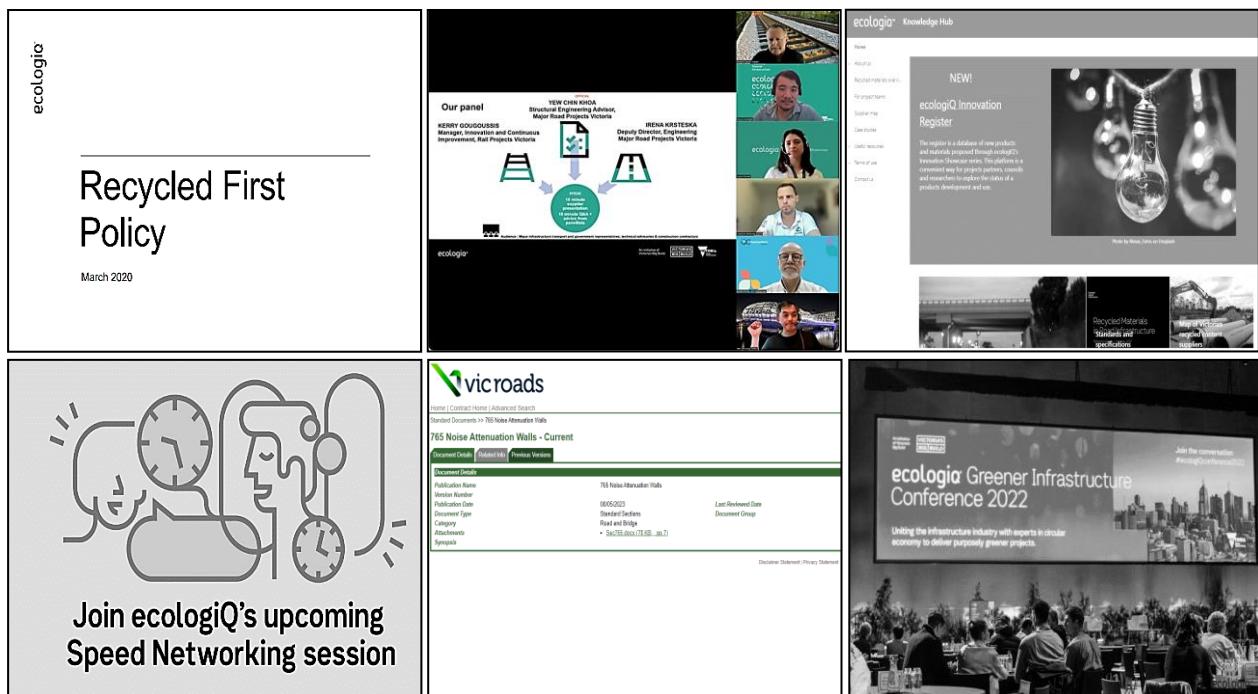


Figure 12. ecologiQ change strategies

Legend: left top (Recycled First Policy), middle top (Innovation showcase series), right top (ecologiQ Knowledge Hub, left bottom (ecologiQ Exchange), middle bottom (Reforms in PwRC specifications), right bottom (Greener Infrastructure Conference)

Moving towards a circular economy involves finding new uses for end-of-life materials and solutions to reuse, repurpose and repair products to divert waste from landfills. The team seeks pitches from both industry and research partners, using Victoria's Big Build as a catalyst for new markets. This presents an opportunity to showcase a new product or innovation relevant to major road and rail projects and escalate ideas to a captive audience. The pitches are reviewed by an expert panel comprising senior Victorian rail, road, and transport department representatives.

³⁰ ecologiQ (2020). Recycled First Policy: Purposefully Greener Infrastructure. Available from <https://shorturl.at/oNU23>

³¹ Victoria Department of Environment, Land, Water and Planning (2020). Recycling Victoria: A New Economy. Available from <https://shorturl.at/MSY19>

Knowledge Hub –

The ecologiQ Knowledge Hub is an online site made available to Contractors, Suppliers, Project Teams and Stakeholders, which provides a central location to access a range of resources to assist with implementing PwRC. Available resources include an interactive PwRC Supplier Map; an Innovation Register, showcasing innovative PwRC research, trial and implementation status; Recycled First Policy documents, including templates, agency procurement guidance and reporting user guides; Visual Guides, showing opportunities to use PwRC in transport infrastructure; Reference Guides, summarising standards and specifications relevant to implementing PwRC; training videos and recorded sessions; a forecast PwRC Demand Model; and an overview of funding and assistance opportunities.

ecologiQ Exchange – The ecologiQ Exchange is an online networking event that helps drive innovation and collaboration across the industry, with ecologiQ's buyer/supplier exchanges helping connect contractors, advisors and project teams to the recycled material supply chain and giving suppliers an understanding of project needs.

Reforms in recycled materials specifications – ecologiQ works closely with the Department of Transport and Planning to review and change the approach to technical standards and specifications for PwRC, as well as identify priority materials for specification changes and type approval. Some of the new applications include recycled plastic products in noise walls, composite sleepers, drainage pipes, and asphalt and crumb rubber on heavily trafficked roads.

Greener Infrastructure conference – The conference explores the role of infrastructure in driving a circular economy, starting with PwRC, and the economic and resource factors shaping the industry's greener future. The conference program features diverse and esteemed keynote speakers, networking events, site tours and a dynamic trade hall where relevant suppliers showcase their products.

4.3 ecologiQ engagement model

This section of the report explores the engagement model of ecologiQ with the state agencies in connection to the change strategies mentioned in the previous section. As outlined in Figure 13, ecologiQ currently works with nine public organisations across the state including two state departments: the Department of Transport and Planning and the Department of Energy, Environment and Climate Action. ecologiQ program is also the link between the suppliers of PwRC and these public agencies.

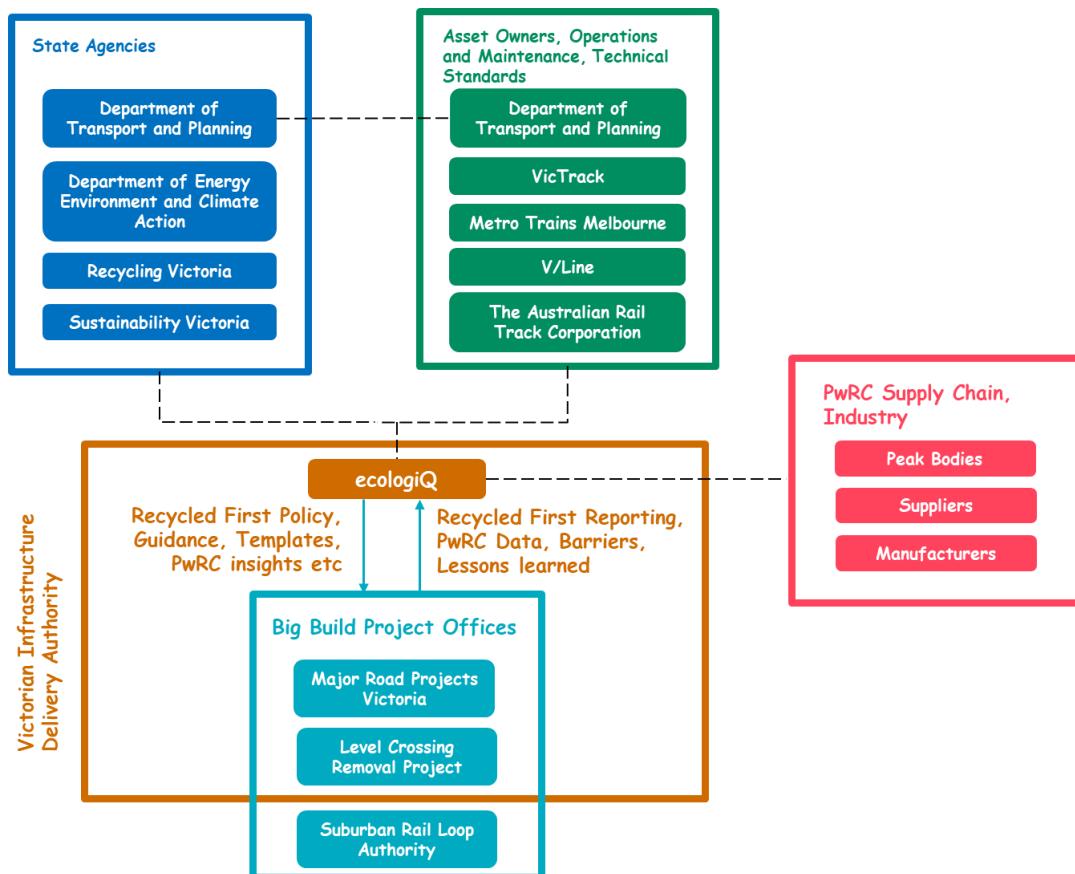


Figure 13. ecologiQ engagement model

4.4 Recognition of ecologiQ activities

In 2023, ecologiQ was among the winners of the Premier's Sustainability Award³² (Industry Leader) in the Circular Economy Innovation Category. The awards, which celebrate organisations in Victoria that lead in sustainability, highlighted ecologiQ's efforts to challenge conventional approaches and demonstrate true leadership in driving greater use of recycled materials in transport infrastructure projects.

5 RECOMMENDATIONS

While ecologiQ has made great progress towards encouraging the use of PwRC in major transport infrastructure projects, other actions can boost their impact in this area. This part of the report provides the recommendations to serve this purpose. While some of these recommendations can be taken on board on the program level, the other recommendations need to be implemented in collaboration with other state agencies such as Sustainability Victoria, EPA and Recycling Victoria. The recommendations include

- Help organisations set KPIs and targets related to the circular economy and the use of PwRC
- Assign a circular economy advisor to construction projects aims to advise on the best strategies for improving the use of PwRC and reporting on the achievements
- Assist businesses that use PwRC in applying for sustainability recognition programs such as IS and UDIA
- Invite representatives from industry leaders to serve on an advisory board or as members of a steering committee
- Develop a local structure to effectively deliver the program objectives while considering the contextual conditions
- Establish a close partnership with state counterparts across the country to coordinate effective initiatives and implement policies
- Expand operations into other subsectors of the building and construction industry
- Establish a regular connection with research and education providers
- Establish a system to verify the quality of PwRC
- Communicate sources to indicate which project is using PwRC
- Install signage on projects where PwRC are used, featuring a QR code that outlines the amount and methods of PwRC utilisation.