The

CE-MAP

CIRCULAR ECONOMY - MEASUREMENTS, ASSESSMENTS AND PATHWAYS

A comprehensive framework for circular economy implementation roadmap, stakeholder action and systemic impact in Victoria

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Additional resources

(1) Progress report: data platform conceptual framing. https://apo.org.au/node/319340.
(2) Towards developing a digital platform for a systemic shift to a circular economy: progress report number 2. https://apo.org.au/node/319339.

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Victorian circular activator project partners

Foreword

Tackling environmental degradation and climate change whilst maintaining our standard of living is *the* most important mission of the 21st Century.

The pathways to achieve this are emerging as businesses, governments, NGOs, communities and academics research, innovate and incentivise. What we do know is that reducing our material footprint by reducing, recycling, avoiding waste, and closing material loops is core to this mission. It also provides business, service and product innovation opportunities to drive jobs and productivity growth for decades. We also know the pathways toward this new economy will require concurrent transformations within business, government, and community.

For many businesses, transitioning to circular economy (CE) principles will surpass mere adaptations of current business and practice. CE-MAP is the product of a research collaboration in the Victorian Circular Activator. It is a self-assessment and CE guidance tool focusing on readiness and guidance to be a CE change agent. Being a CE change agent means thinking in new and innovative ways about product, design, and services; organisation and people; and the network of businesses and stakeholders that change agents operate.

Becoming a CE change agent is, however, not an end goal in itself – but the starting point to drive real and sustained innovation in sustainability and economy. They do this by creating pathways to a circular and regenerative economy that minimises waste, maximises resource efficiency, and fosters sustainable practices, ultimately paving the way for a more resilient and prosperous Victorian future.

Associate Professor Christian (Andi) Nygaard
Director, Centre for Urban Transitions

I am excited to introduce this report on the CE-MAP as the project lead for the Victorian Circular Activator (VCA). The VCA is a pioneering initiative that aims to support the transition to a CE in Victoria by providing a physical and digital infrastructure that connects businesses, entrepreneurs, researchers, government, and the community. We are able to achieve this through partnerships with a range of stakeholders.

The CE-MAP is a crucial part of the VCA. It provides businesses, policymakers, and communities, with a comprehensive guide on the journey towards CE, providing valuable insights into implementation strategies and indicators. This report offers an in-depth analysis of the CE-MAP's change domains and measurement framework and presents a set of application scenarios that demonstrate its practical use in different sectors. The report aims to provide a clear understanding of how the CE-MAP can be used as a tool to drive CE transitions.

We believe that the transition to a CE is not only an environmental necessity but also an opportunity for innovation and economic productivity, creating new jobs in the process. As an initiative of the VCA, the CE-MAP is designed to empower stakeholders across the economy to capture circular innovation benefits through diagnostic tools and structured programs such as the CIRCLE program.

We hope this report will serve as an invaluable resource for all interested in exploring the potential of a change framework. We invite you to join us on this exciting journey towards a more sustainable future.

Professor Usha Iyer-Raniga
Project Lead, Victorian Circular Activator

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Executive summary

The **Circular Economy - Measurements, Assessments and Pathways** (CE-MAP) represents a robust and comprehensive framework for driving CE transitions in Victoria. This report presents a detailed analysis of the CE-MAP, highlighting its significance as a transformative tool for sustainability stakeholders across industries, academia, government, and communities. The framework envisions a regenerative economy that minimises waste, maximises resource efficiency, and fosters sustainable practices, ultimately paving the way for a more resilient and prosperous future.

At the core of the CE-MAP lies its three fundamental Change Domains: Enabling Environment, Market Creation, and Organisational Change. Each Change Domain encompasses a set of strategic objectives, outcomes, and indicators that guide stakeholders in their CE efforts.

Within the Enabling Environment, the framework focuses on creating supportive policies, financing mechanisms, and knowledge-sharing platforms to facilitate CE implementation at a systemic level. The Market Creation Change Domain emphasises the need to generate demand for circular products and services, promote innovative business models, and integrate circular principles across supply chains. In the Organisational Change domain, the framework addresses the internal transformation required within organisations, such as fostering circular design, enhancing workforce skills, and aligning corporate values with CE principles.

Accurate measurement and data collection are critical for effectively assessing CE progress and identifying areas for improvement. As part of the CE-MAP, this report presents a comprehensive measurement and data framework, categorising indicators into environmental, economic, social, and governance and policy domains.

These indicators provide a holistic view of CE implementation, including waste and pollution reduction, energy consumption and carbon footprint, job creation, stakeholder engagement, and circular design. Stakeholders can leverage the CE-MAP to set clear objectives, align with the systemic landscape, develop strategic action plans, and measure and monitor their CE progress.

Furthermore, the report explores the use of various data collection methods, including metrics, surveys, interviews, case studies, and expert reviews for CE management strategy evaluation. These data collection approaches enable stakeholders to gather qualitative and quantitative insights, supporting evidence-based decision-making and refining CE strategies.

While the CE-MAP offers a transformative roadmap, stakeholders may encounter challenges in its implementation. These challenges could include resistance to change, limited resources, or inadequate data collection capabilities. Stakeholders must acknowledge and address these obstacles to ensure the successful adoption of the framework and foster a collaborative environment for overcoming barriers.

To enhance the effectiveness of the CE-MAP, stakeholders must prioritise capacity-building efforts, fostering a culture of continuous learning and knowledge sharing. Engaging in collaborative research and development initiatives across diverse sectors can enrich the understanding of circular principles and lead to innovative solutions. Stakeholders can create an ecosystem that promotes successful CE transitions by proactively addressing challenges and leveraging collaborative networks.

Introduction

The importance of a circular economy

The CE is a framework that provides stakeholders, including businesses and government actors, with the tool to implement systemic and sustainable solutions that address economic and environmental challenges such as waste and climate change. CE strategies facilitate our society to use resources more efficiently, reduce the negative environmental impact of economic activities, and create net-positive and regenerative outcomes.

In a CE, existing resources are utilised to their maximum value during their lifecycle through maintenance, repair, reuse and repurposing. The residual value of used resources is recovered to feed back into the economy, and the recycling system provides secondary resources in production processes.

The Knowledge Hub[1] indicates that a critical element of the CE is substituting finite natural resources with renewable and non-toxic ones. For instance, regenerative energy involves the electrification of operations, adoption of renewable energy and implementation of energy efficiency measures.

Collaboration opportunities exist within a circular system for stakeholders such as government, businesses and communities to regenerate natural capital, transform inefficient business models, redesign products and services, and advance circular knowledge and innovation.

Source: Metabolic[2]

Victoria's aim for a circular economy

Australia is well-positioned to gain significant economic and environmental benefits by transitioning to a CE. PwC[3] estimates that by 2040, 165 million tonnes of CO2 could be saved annually, and $1.9 trillion could be accumulated in direct economic benefits in Australia.

As a highly diversified economy, Victoria aims to lead Australia's CE transitions. The recently established Recycling Victoria is the agency overseeing the implementation of Victoria's 10-year policy and action plan for waste and recycling. The State's CE goals include designing to last, repair and recycle; using products to create more value; recycling more resources; and reducing harm from waste and pollution. These targets are a key driver for local councils to implement CE strategies.

While the metrics to evaluate progress against Victoria's 2030 CE goals are commendable, the CE-MAP detailed in this report is based on a more ambitious plan to transition the State to a sustainable CE.

The need for the CE-MAP

Implementing CE transitions can be complex and create unexpected consequences as a systemic change. Moreover, stakeholders such as businesses, governments and communities often have varied processes and strategies for working toward change, including diverse and sometimes conflicting interests in change outcomes.

The CE-MAP is vital to visualise the complex interactions across systems and actors. The framework details the activities, outputs and outcomes of immediate, intermediate and long-term circular transition processes for Victoria.

The CE-MAP is a tool that stakeholders can incorporate into strategic planning to create bespoke CE roadmaps and align their operations with broader systemic changes in Victoria. In addition, this report provides a starting point for stakeholders to develop decisions and measures to achieve CE goals. It also presents an adaptive governance framework for monitoring and evaluating CE projects.

VICTORIA'S 2030 CE PROGRESS METRICS[4]

80% of waste diverted from landfill by 2030, and an interim target of 72% by 2025

15% per capita of waste generation cut by 2030

50% reduction in the volume of organic material lanfilled between 2020 and 2030, with an interim target of a 20% reduction by 2025

100% of Victorian households have access to food and garden organic waste recycling services or local composting by 2030


Mapping Pathways

The process of developing the CE-MAP

The research that informed this report followed a 6-stage process to develop the comprehensive CE-MAP for Victoria to achieve the CE. By adopting systems thinking approaches, the study provides a more holistic understanding of the complex processes, actors, strategies and challenges involved in Victoria's CE transitions. Evolutionary economics, social practices, socio-technological transitions, socio-ecological systems, organisational change and social learning are some theoretical frames that inform the CE-MAP.

The outcome of stages three to six of the research process is presented here. This draws on the findings from the literature review, systems mapping and synthesis sessions, and interviews conducted in the first two stages. The data collection methods have been detailed in progress reports.[5, 6]

STAGES OF DEVELOPING THE CE-MAP

BREAKDOWN OF INTERVIEW PARTICIPANTS

Government Organisations
2 State Government Agencies
6 Local Government Councils

Sustainability Experts
1 Organisational Change and Sustainability Academic Scholar
1 Organisational Change and CE Consultant
1 Carbon Negative and CE Expert
1 Value Stream Mapping and Process Flow Analyst

Businesses
3 Technology / Processing Sector
2 Manufacturing Sector
1 Logistics Sector

Swinburne University's Human Research Ethics Committee approved the in-depth interviews with CE stakeholders in Victoria. The discussions covered topics on Victoria's CE landscape, such as:

- the operations of participating organisations
- the transition stage of participating organisations
- the business strategies and models participating organisations adopt to create viable CE offerings
- the opportunities, challenges, enablers and barriers to adopting CE practices

The Systems View

Overview of the CE-MAP

The CE-MAP aims to:

Support a systemic shift to CE in Victoria

The framework facilitates the development of CE strategies within change domains: the Enabling Environment, the Organisational Change and the Market Creation.

Based on the current trajectory of CE adoption in Victoria, we expect system transformations across the change domains to consolidate over the longer timeframe. We map out the transition that involves specific CE activities and outputs, short-term outcomes, medium-term outcomes and long-term outcomes beyond which we expect Victoria to have transitioned entirely to a CE system.

Assumptions underlie the formulation of the CE-MAP, such as thinking about how change happens, the transition timeline, the role of actors and the sequence of activities. These assumptions are informed by evidence from multi-disciplinary literature reviews, stakeholder interviews and systems mapping and synthesis sessions.

Enabling Environment

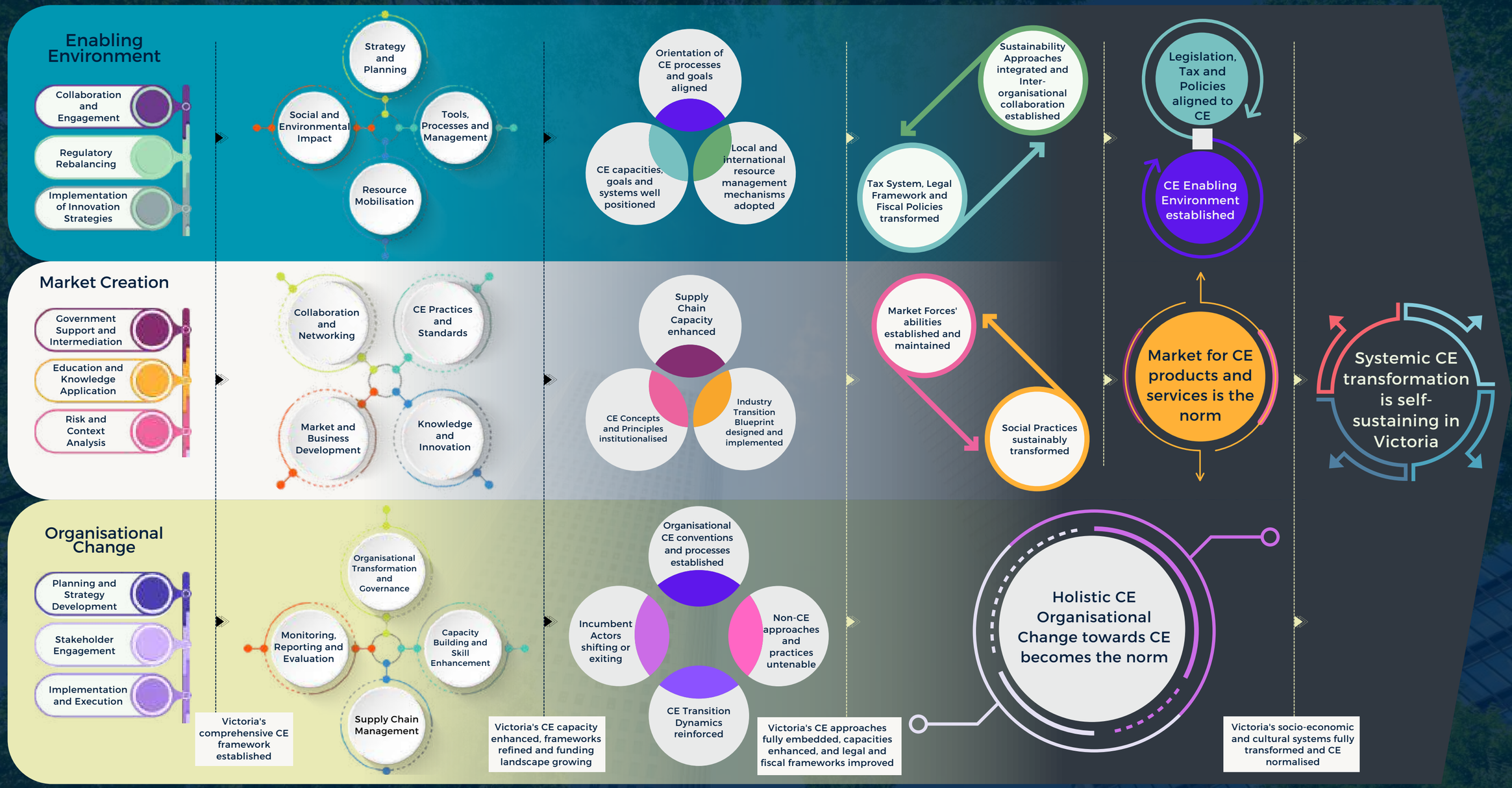
External factors, especially innovation and regulation, help to facilitate the adoption of CE practices. Mechanisms include industry learning, codesign mechanisms, regulation and policy, and innovation capacity.

Organisational Change

Internal change processes occur within an organisation during the transition to CE models—for instance, through the mechanisms of goal setting, upgrading of competencies and reframing of all decision contexts.

Market Creation

Ultimately, the transition requires CE products and business models in supportive markets. Factors that enable the creation of CE markets include mainstreaming sustainability practices, developing viable CE products and business innovation.


ACTIVITIES
OUTPUTS
SHORT-TERM OUTCOMES
MEDIUM-TERM OUTCOMES
LONG-TERM OUTCOMES
IMPACT
Enabling Environment
Collaboration and Engagement
Regulatory Rebalancing
Implementation of Innovation Strategies
Strategy and Planning
Social and Environmental Impact
Tools, Processes and Management
Resource Mobilisation
Orientation of CE processes and goals aligned
CE capacities, goals and systems well positioned
Local and international resource management mechanisms adopted
Sustainability Approaches integrated and Inter-organisational collaboration established
Tax System, Legal Framework and Fiscal Policies transformed
Legislation, Tax and Policies aligned to CE
CE Enabling Environment established
Market Creation
Government Support and Intermediation
Education and Knowledge Application
Risk and Context Analysis
Collaboration and Networking
CE Practices and Standards
Market and Business Development
Knowledge and Innovation
Supply Chain Capacity enhanced
CE Concepts and Principles institutionalised
Industry Transition Blueprint designed and implemented
Market Forces' abilities established and maintained
Social Practices sustainably transformed
Market for CE products and services is the norm
Systemic CE transformation is self-sustaining in Victoria
Organisational Change
Planning and Strategy Development
Stakeholder Engagement
Implementation and Execution
Organisational Transformation and Governance
Monitoring, Reporting and Evaluation
Capacity Building and Skill Enhancement
Supply Chain Management
Organisational CE conventions and processes established
Incumbent Actors shifting or exiting
Non-CE approaches and practices untenable
CE Transition Dynamics reinforced
Holistic CE Organisational Change towards CE becomes the norm
Victoria's comprehensive CE framework established
Victoria's CE capacity enhanced, frameworks refined and funding landscape growing
Victoria's CE approaches fully embedded, capacities enhanced, and legal and fiscal frameworks improved
Victoria's socio-economic and cultural systems fully transformed and CE normalised

Assumptions underlying the CE-MAP

Multiple Change Processes

The CE-MAP involves multiple change processes that are predominant in specific domains but directly or indirectly interact with those in other domains

Cumulative Causation

CE activities implemented at the start of the transition trigger change processes that result in tipping points

Tipping Points

Critical thresholds along the CE-MAP within each domain will lead to significant and permanent changes. A systemic tipping point is expected around the medium to long term

Positive Feedback Effect

Fast-growing community and business acceptance of the need for CE will spill over into government action and amplify the momentum of change needed in each domain

Negative Feedback Effect

Resistance and inertia among major incumbent businesses, community disapproval and government inaction are factors that can reduce or prevent the momentum of CE change

Convergence towards CE

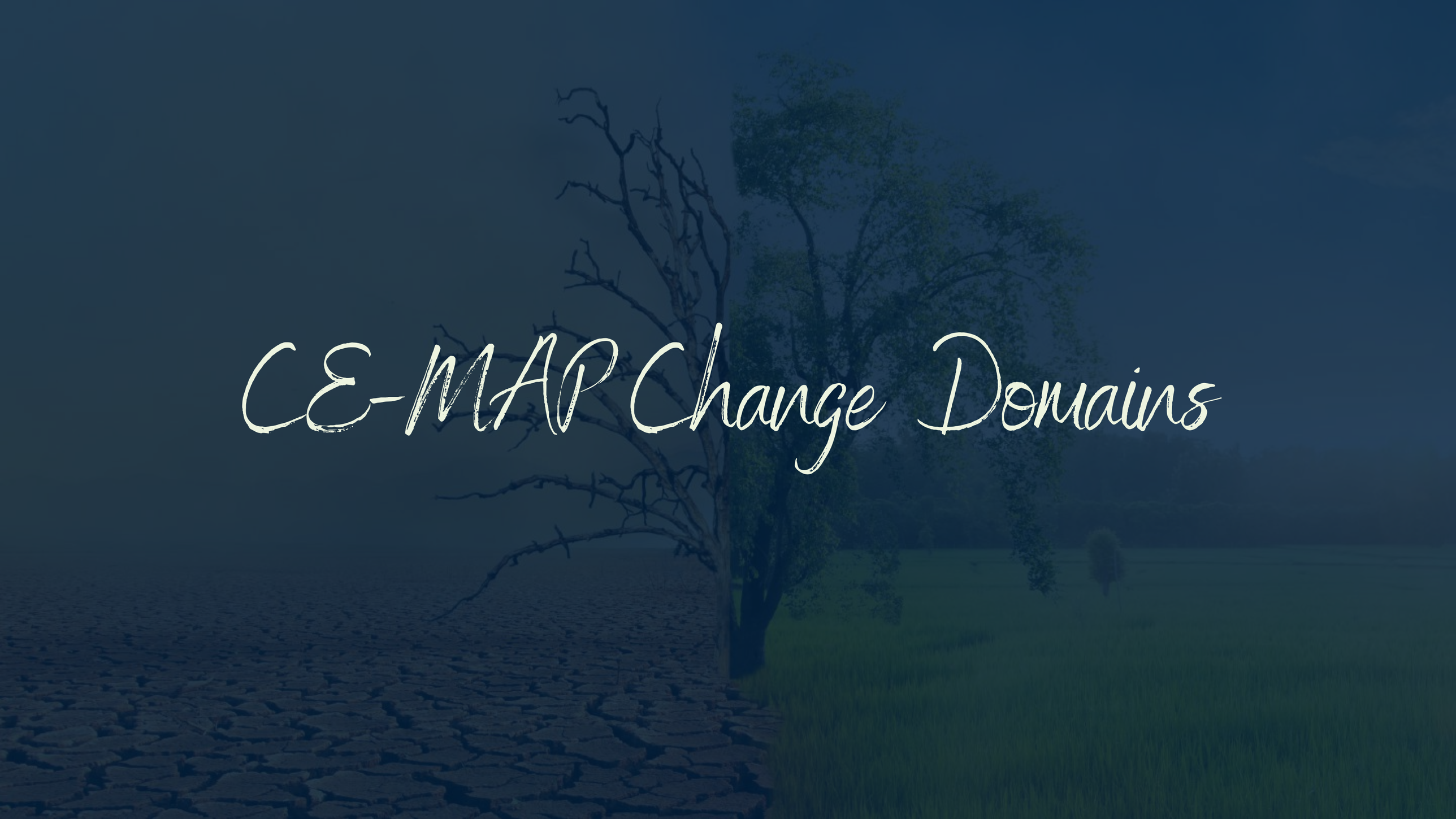
Positive feedback effects are expected to outweigh negative feedback to create progress towards CE. However, the speed and articulation of such progress are unpredictable

Data Infrastructure

Data systems, including hardware, software, networks, services and policies, are expected to underlie and drive the majority of the CE processes, such as the feedback loop

TIMELINE FOR CHANGE

Based on the current trajectory of CE adoption in Victoria, holistic system transformations across the change domains are expected to consolidate over the longer timeframe. However, socioeconomic disruptions could further accelerate the transition.



CE-MAP Change Domains

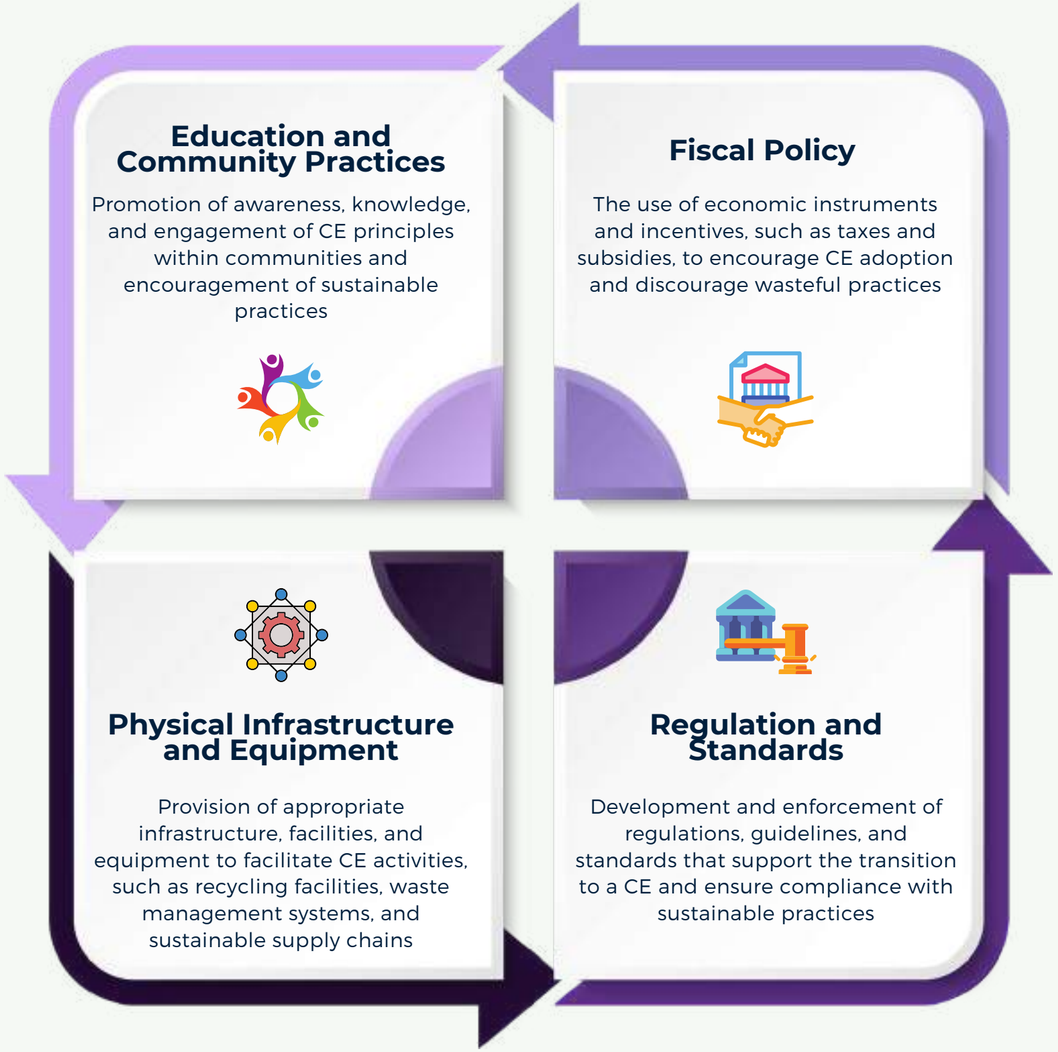
Enabling environment

The enabling environment is crucial in facilitating the transition to CE. It encompasses key mechanisms, such as education and community practices, fiscal policies, regulations and standards, physical infrastructure and equipment, and considering unintended consequences. These themes create the conditions necessary for a successful transition towards a more sustainable and circular model of production and consumption.

CE-MAP's enabling environment domain is presented on pages 13 and 14. A range of activities are undertaken within the enabling environment to achieve this transition. Mechanisms include co-design and visioning, standardising sustainability and circularity assessments, adopting new financial systems, and institutionalising learning and adaptation processes. They aim to generate outputs such as establishing CE conventions and actions that draw on sustainability assessments, enhancing supply chain capacity, and realigning financial incentives. These outputs serve as building blocks for further progress.

In the short term, the enabling environment leads to improved alignment of processes and goals, enhanced sustainability capacities, and adoption of sustainable resource management mechanisms. These outcomes lay the foundation for medium-term results, including integrating sustainability approaches into everyday practices, refining legal frameworks and fiscal policies, and transforming tax systems to incentivise circularity. By nurturing an enabling environment that supports CE principles, we can foster lasting change and achieve long-term outcomes where circularity becomes the norm across industries, markets, and organisations.

Enabling Environment Interconnected Themes for CE Transitions



ACTIVITIES

Collaboration and Engagement

Co-design Mechanisms Adoption
Identify and mobilise champions, key partnerships and the coalition of the willing to co-design CE solutions and create impact through participatory, gender-sensitive, empowering and open approaches

Regulatory Rebalancing

Standardisation of Sustainability and Circularity Assessment
Develop and publicise indicators that aid the process of identifying, measuring and evaluating the potential impacts of sustainability and circular practices

Standardisation of Packaging
Develop and adopt sustainability packaging standards and requirements in production processes and technologies across the supply chain

Fiscal Mechanisms Development
Provide financial resources to implement CE-related programmes and strategies, e.g., subsidies, taxes, loans, grants, investments and donations

Innovation Strategies Formulation

Monitoring Flows
Examine and evaluate the order of consecutive tasks that are carried out to achieve sustainability/CE goals and objectives

Experimentation
Institutionalise learning and adaptation processes and an environment that encourages institutional competition

Enabling Environment's circularity fostered

OUTPUTS

Strategy and Planning

CE Vision established
Collectively agreed-upon vision of CE transitions established among stakeholders

Capacity of Intermediaries enhanced
Capacity of intermediaries (including virtual intermediaries) enhanced to catalyse industry-wide learning and CE adoption

Sustainability Assessment developed
Sustainability assessment becomes the basis for learning by doing through, e.g., experimentation

Communities of Practice supported
Communities of practice are developed around CE principles and supported

Transition Champions recruited
Transition champions or actors, including businesses that have already adopted CE practices and models, are recruited to guide and support CE initiatives

Resource Mobilisation

Funding Landscape growing
Consistent and growing funding landscape with private sector finance increasingly invested

Social and Environmental Impact

Unintended Consequences minimised
Unintended consequences are minimised and mitigated

Environmental Justice Issues Identified
Issues of environmental justice relating to adopting CE practices are identified and addressed

Tools, Processes and Management

Engagement Tools and Processes developed
Tools and processes that utilise creative methods to engage sustainability stakeholders in designing CE solutions and practices are developed

Monitoring and Evaluation Framework refined
Industry-specific or waste stream-specific monitoring and evaluation framework refined and adopted

CE Databases maintained
Efficient CE databases are created and maintained

Collective Behaviour predictable
Predictability and economies of scale in behaviour achieved with actors starting to behave in mutually agreed ways

Enabling Environment facilitates broader CE adoption

SHORT-TERM OUTCOMES

MEDIUM-TERM OUTCOMES

LONG-TERM OUTCOMES

IMPACT

Orientation of CE processes and goals aligned

Orientation of CE processes and goals at micro, meso and macro levels are aligned

CE capacities, goals and systems well positioned

CE and sustainability capacities, goals, systems and commitments among stakeholders and actors are well positioned

Local and international resource management mechanisms adopted

Local and international mechanisms that promote cleaner production, end-of-life material management and sustainability strategies are adopted

Enabling Environment aligned with CE processes and sustainability goals

Sustainability Approaches integrated and Inter-organisational collaboration established

Sustainability Approaches embedded
Sustainability concepts, principles and approaches are embedded into the routines and practices of the society

Inter-organisational exchange
Inter-organisational sustainability knowledge, skills and training are created and exchanged within and among industries

CE Capabilities and Resources enhanced
Capabilities and resources for discovering CE opportunities and transforming existing systems are enhanced

Tax System, Legal Framework and Fiscal Policies transformed

Legal Framework and Policies improved
Legal frameworks, fiscal policies and tax implications that encourage the adoption of circular models are improved

Tax System transformed
The tax system is transformed to tax resources rather than labour

Policy Measures scaled back
Policy measures and financial incentives for CE products and organisational change are scaled back and eventually removed

Enabling Environment optimised for systemic CE adoption

Legislation, Tax and Policies aligned to CE

Legislation, taxes and policies are aligned to support CE

CE Enabling Environment established

Enabling Environment for CE transition is established and CE becomes the norm

Enabling Environment aligned with other change domains for complete CE transitions

CE Enabling Environment is self-sustaining in Victoria

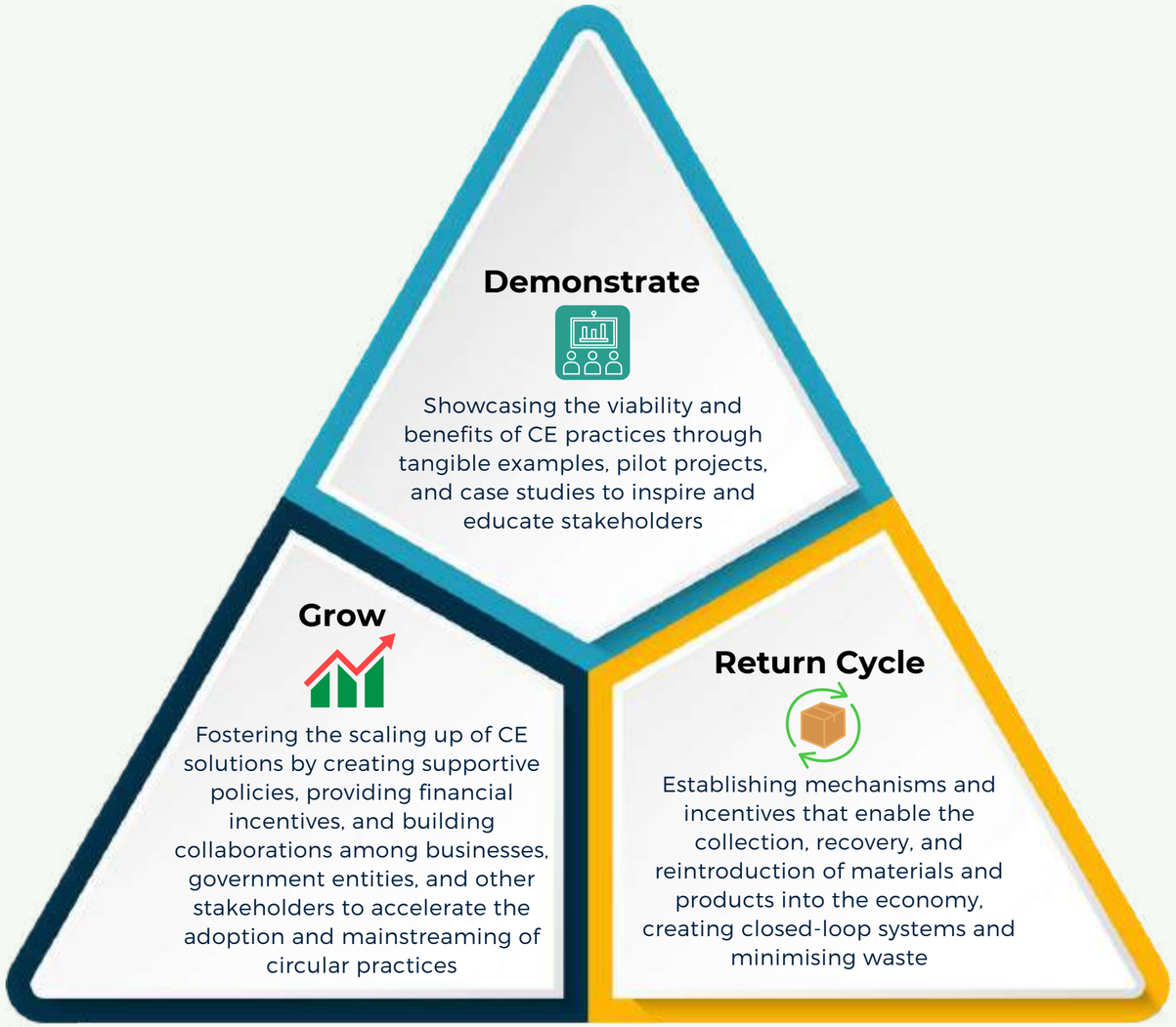
Market creation

Market creation is a crucial element within the CE-MAP that aims to normalise the CE products and services market. CE-MAP's market creation domain is presented on pages 16 and 17. Through the themes of "Demonstrate," "Return Cycle," and "Grow," market creation activities focus on showcasing successful CE initiatives, establishing efficient material flows, and driving the expansion of the CE market.

The outputs of market creation encompass developing and promoting CE products, establishing circular supply chains, and cultivating consumer awareness and demand for circular solutions. In the short term, market creation leads to enhanced supply chain capacities, institutionalised CE principles and practices, and a developed industry transition blueprint. In the medium term, it drives establishing and maintaining market forces' abilities and sustainably transforming social practices. Meanwhile, the long-term goal of market creation is to establish a thriving circular marketplace where circularity is mainstream, consumer behaviour aligns with sustainability, and the CE becomes the norm.

Ultimately, effective market creation transforms the market, where CE products and services become the norm rather than the exception. This impact is characterised by widespread acceptance and demand for CE solutions and the integration of circular practices into various sectors. A self-sustaining market for CE products and services signifies a shift towards a more sustainable CE, where resource efficiency, waste reduction, and circular practices are deeply embedded in our production, consumption, and business processes.

Market Creation Interconnected Themes for CE Transitions



ACTIVITIES

Government Support and Intermediation

Advocacy and Intermediation
Promote sustainability/CE principles, values and solutions in business, policy and consumer practices through awareness creation, lobbying and public discourse

Government Support Provision
Provide guidelines, regulations, processes, finance and other socio-political resources that could boost the CE market or aid the adoption of CE practices among businesses and consumers

Intermediaries Engagement
Engage agents such as actors, entities or (virtual) platforms who connect diverse groups of actors involved in CE transitions

Procurement Strategy Refinement
Refine procurement practices across government and industry

Education and Knowledge Application

Sustainability Education Provision
Increase the knowledge or understanding of sustainability and CE e.g., incorporating sustainability into higher education curricula and awareness creation among business owners, policymakers and the general public

Market Research
Collect and analyse information on CE target markets, opportunities, customers bases, product viability and regulatory environment

Product and Service Development
Perform the process or activities that enable the conceptualisation, development and launch of competitive CE product/service to the market

Circular Business Model Innovation
Design processes and strategies that aid organisations in creating value propositions through product and service offerings that reinforce CE principles such as designing out waste, restoring material lifecycle and regenerating natural systems

Risk and Context Analysis

Risk Profile Assessment
Assessment of the threats existing in the market with the capacity of the organisation to tolerate or take risks to achieve set CE goals is developed

Context Change
Provide adequate sustainable infrastructure to enhance people's performance of sustainability practices

Circular Market Ecosystem established

OUTPUTS

Policy and Standards

CE Standards and Practices refined and regulated
Industry-led refinement of standards and practices constrained by regulations to minimise greenwashing and unintended consequences

Collaboration and Networking

Advocacy Coalitions established
Advocacy coalitions, which are channels and accesses to participate in political activities, cultivate political influence and build good connections with the government, are established and enhanced

CE Communities of Practice supported
Communities of practice promoting CE principles and practices are developed and supported

Market and Business Development

Market's CE Potential expands
Market potential for CE products and services expands and diffuses more product and services

Consumer Competences increased
Competences of consumers are increased, which is the ability to make decisions based on knowledge of circularity

CE Hub established
Institutions, hubs or networks that are dedicated to acquire, share and exchange CE knowledge and skills are established and maintained

CE Behaviour diffuses
Diffusion of CE behaviours into associated product classes

Knowledge and Innovation

Technologies aiding CE Principles developed
Technologies that aid the application of CE principles are developed and improved through industries

CE Products and Services developed
Products or services that possess circularity features, attract customers and improve the profitability of the business are developed and demonstrated

Socialisation of CE Practices emerged
Emergent socialisation of CE practices that demonstrate the growth of CE products and services (include postcriptive and prescriptive behaviours)

Circular Market Ecosystem and sustainable business models are thriving

SHORT-TERM OUTCOMES

MEDIUM-TERM OUTCOMES

LONG-TERM OUTCOMES

IMPACT

Supply Chain Capacity enhanced

The ability of a business to generate, absorb and utilise a certain volume across the supply chain over a specified period is enhanced. This could be related to the business' input, output or a mixture of both

CE Concepts and Principles institutionalised

CE concepts, principles or approaches are embedded around particular industries/sub-sectors/behavours. This also includes institutionalising new CE approaches into the business environment

Industry Transition Blueprint designed and implemented

The pace of transition (temporal profile of transition dynamics) of each industry/sectoral blueprint and schedule of transition are co-designed and put into action

Circular Market Ecosystem is flourishing and further catalysed

Market Forces' abilities established and maintained

The ability of the market forces to create new products, services and creative destruction is established and maintained

Social Practices sustainably transformed

The practices or bundle of activities that comprise people's daily lives are sustainably transformed.

Circular Market Ecosystem is sustainably transformed

Market for CE products and services is the norm

Circular Market Ecosystem is mainstreamed and systemically integrated

CE Market is self-sustaining in Victoria

Organisational change

The organisational change domain focuses on enhancing competencies, knowledge, procedures, and value compass within organisations to drive the transition towards a CE.

CE-MAP's organisational change domain is presented on pages 19 and 20. Activities within the organisation change domain aim to equip organisations and their workforce with the necessary tools, skills, understanding, and ethical framework to embrace circular practices. These result in outputs that contribute to building the capacity and readiness of organisations to adopt CE approaches. The short-term outcomes signify the initial progress in aligning organisations with CE principles and practices by establishing CE conventions and processes, rendering non-CE approaches and practices untenable, reinforcing CE transition dynamics, and prompting incumbent actors to shift or exit.

Moving forward, organisational change's medium-term and long-term outcomes revolve around achieving holistic CE organisational change, where CE approaches become the norm. This includes comprehensive transformations in corporate culture, processes, and strategies to embrace circularity fully.

The impact of organisational change lies in the self-sustainability of CE within organisations in Victoria. It signifies the successful integration of CE principles, practices, and mindsets into everyday operations, resulting in long-lasting and self-reinforcing circular practices that contribute to sustainable resource use, reduced waste generation, and new business opportunities.

Organisational Change Interconnected Themes for CE Transitions

ACTIVITIES

OUTPUTS

Stakeholder Engagement

Reflexivity
Engage in a deeper reflective process that involves the mapping and dialogue-based analysis of the methods, values and goals of CE transitions

Stakeholder Support
Institutionalise and systematise preparedness and support to make and manage stakeholders during the CE change process

Implementation and Execution

Baseline Establishment
Analyse current organisational model and strategy in relation to CE business values, knowledge, competencies and procedures

Training Programmes
Design and execute activities to equip the workforce with CE knowledge and skills, such as workshops and seminars

Recruitment Strategies
Develop plans and procedures for identifying, recruiting and hiring the best workforce to enable the organisation to achieve CE goals

Business Rules Update
Revise and improve existing guidelines, procedures, directives and principles that describe and constrain the operations, business structure and practices of an organisation to reflect sustainability/CE values

Knowledge of Measurement
Develop the knowledge of how to measure CE organisational behaviour/standards

Key Performance Indicators
Develop KPIs to achieve CE goals and CE research and development

Social Learning
Learn and adapt practices to develop and refine CE business model through social interaction with other actors/organisation, social enhancement and emulation

Planning and Strategy Development

Organisational Envisioning
Develop a clear shared CE vision, values and define new CE goals, aspirations and desired impact

CE Feasibility Planning
Assess the practicality and viability of transitioning business practices into CE business models, such as technical, economic, financial, legal and environmental considerations

Organisations processes, structures and cultures aligned with CE

Monitoring, Reporting and Evaluation

Business CE Standard Reporting developed
Business CE standard reporting and progression metrics at sectoral level are developed, such as investment in CE R&D

CE Environment monitored and evaluated
The CE environment at organisational level are monitored and evaluated

Supply Chain Management

Supply Chain pressured for CE Adoption
Pressure is put on supply chains to adopt CE business model practices

Organisational Transformation and Governance

Organisational Culture and Processes transformed
The organisational culture and processes are transformed to reflect CE norms, practices, principles and strategies

Internal Governance Process established
Governance processes are established within organisations

CE Strategy developed and implemented
The steps and decisions needed at different stages or timescales to adopt CE principles, embed circularity-related goals into KPIs or in other ways making sure it is a key part of the goals of the organisation are detailed and implemented

CE Champions identified and supported
People with vision, strong will, power, influence and credibility to advocate, support and facilitate internal change are identified and supported at every organisational level

Capacity Building and Enhancement

Workforce CE Skills and Knowledge enhanced
The CE skills and knowledge of all levels of an organisation's workforce are enhanced

Internal CE Tools and Applications adopted
New tools and applications that aid in the circular transformation of the internal practices of an organisation are adopted

CE becomes integral to organisations' operations and culture

SHORT-TERM OUTCOMES

MEDIUM-TERM OUTCOMES

LONG-TERM OUTCOMES

IMPACT

Organisational CE Conventions and Processes established

Organisational conventions and processes that encourage the development of CE knowledge and competence are established

Non-CE Approaches and Practices untenable

Non-CE approaches and practices become untenable (for instance, CE employer-employee relations are embedded in processes like bargaining agreements)

CE Transition Dynamics reinforced

Positive feedback effect between macro-micro scales reinforcing CE transition dynamics

Incumbent Actors shifting or exiting

Incumbents/inert actors are shifting to CE or exiting

CE practices the only viable and dominant approach in organisations

Holistic CE Organisational Change towards CE becomes the norm

Organisational CE transition is fully underway

Organisations are fully transitioned to CE

CE Organisational Change is self-sustaining in Victoria

Data and Measurement

Measurement framework

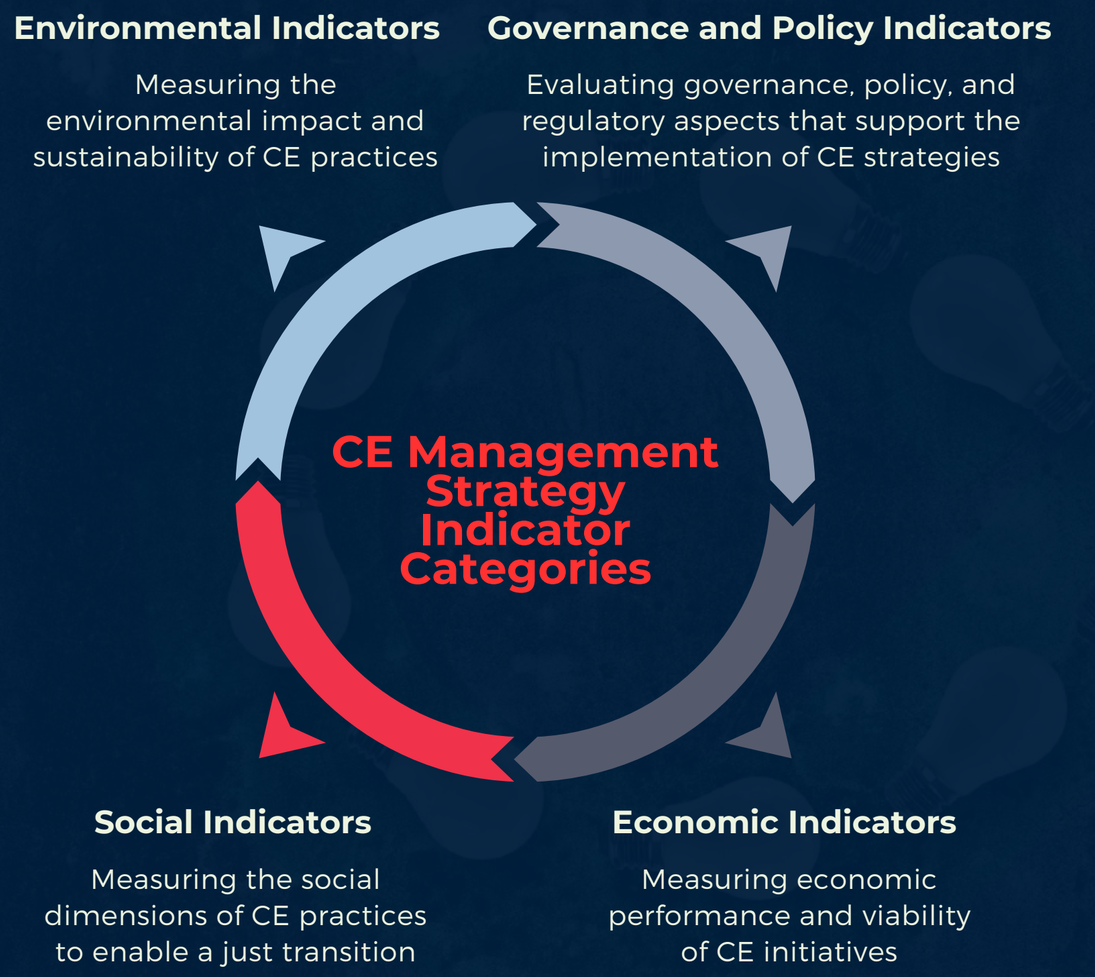
The comprehensive CE management strategy evaluation framework provides a holistic approach to evaluating the progress, impact, and effectiveness of stakeholders' CE initiatives. The framework is designed for change agents who are involved in various stakeholders' CE initiatives, including project managers, sustainability practitioners and government agents. It allows for a balanced assessment of environmental, governance, economic, and social aspects, guiding change agents toward informed decision-making and continual learning in their CE efforts.

Environmental indicators track waste and pollution reduction efforts, energy consumption, carbon footprint, and resource conservation. By monitoring these indicators, stakeholders can assess how their initiatives help to reduce environmental impact and promote resource efficiency.

Governance and policy indicators are related to the vision, commitment, policy framework, stakeholder engagement, and measurement and evaluation of CE strategies. These indicators help assess the effectiveness of governance structures, policy frameworks, and stakeholder collaboration in driving CE implementation.

Economic indicators relate to circular business models, resource efficiency, and innovation. These indicators measure the economic benefits, revenue generation, and productivity improvements from CE practices.

Social indicators focus on social issues, such as job creation (which is also an economic indicator), skills development, social equity, and consumer behaviour change. They provide insights that form the basis for just CE transitions.



Environmental indicators

Circular design		Material selection and resource efficiency Design for end-of-life management Waste reduction and efficiency User-centred and energy-efficient design
Waste and pollution reduction		Waste diversion rates Recycling rates Waste reduction Pollution prevention measures
Energy and carbon footprint		Energy consumption reduction Renewable energy adoption Greenhouse gas emissions reduction Carbon footprint assessment
Resource conservation and regeneration		Resource recovery rates Use of recycled materials Sustainable sourcing practices Ecosystem restoration efforts

Governance and policy indicators

CE vision statement Commitment to CE principles Leadership engagement		Vision and commitment
Supportive policies and regulations Integration of CE principles into legislation Alignment with national and international frameworks		Policy and regulatory framework
Coordination of diverse stakeholders Collaboration across sectors Engagement with local communities and civil societies		Stakeholder engagement and collaboration
M&E frameworks for CE initiatives Performance tracking and reporting Impact assessment of CE strategies		Measurement and evaluation

CE Management Strategy Evaluation

Social indicators

Job creation and skills development		CE-related jobs creation Training and upskilling programs Workforce diversity and inclusivity
Social equity and well-being		Social impact assessments Community well-being indicators Fair and equitable distribution of benefits Access to CE opportunities
Consumer awareness and practice change		Consumer awareness Sustainable consumption patterns Practice change towards circularity Attitudes aligned with CE practices

Economic indicators

Adoption of circular business models Revenue from circular activities Circular supply chain integration		Circular business models
Material and energy intensity Resource consumption reduction Eco-design integration Waste reduction		Resource efficiency and productivity
Investment in CE research and development Patents and innovations related to CE Collaboration with research institutions Business model innovation		Innovation and research

Data framework

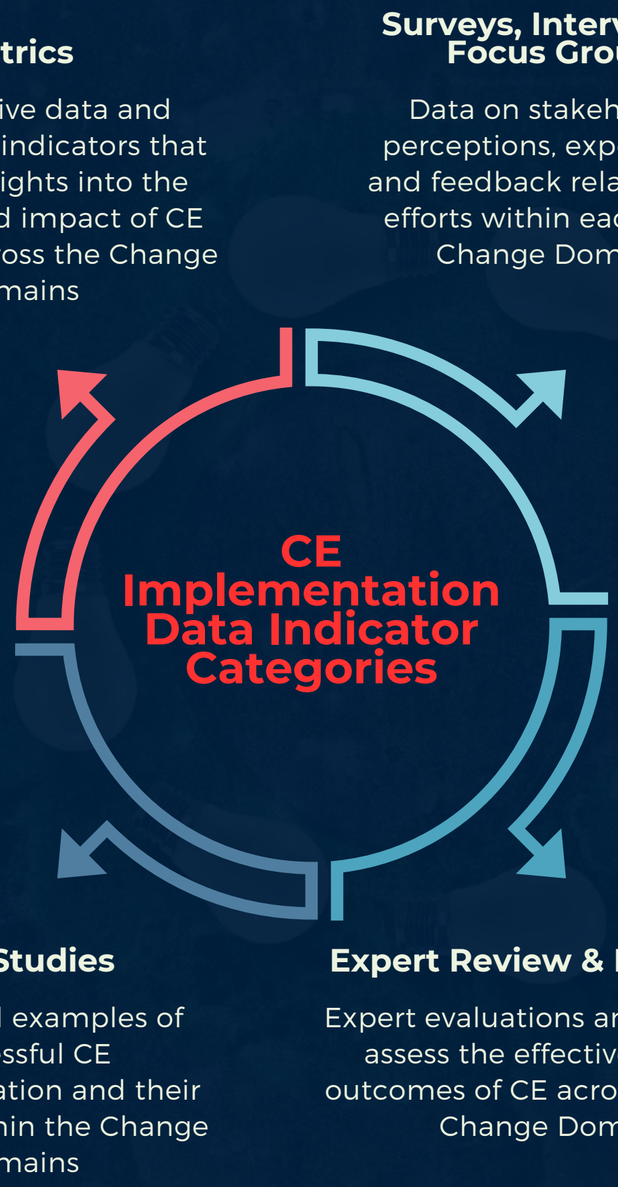
The data framework employs a combination of data collection methods that provide a comprehensive and multi-dimensional understanding of CE progress and impact. The framework supports more informed decisions, helps identify successful strategies, and allows for addressing challenges in driving the transition to a more sustainable CE.

Metrics are quantitative data that measure the progress and outcomes of CE efforts. These enable stakeholders to assess CE initiatives' financial performance, growth, and adoption rates within different domains.

Surveys, interviews, and focus groups help stakeholders understand stakeholder perspectives, identify areas for improvement, and strengthen engagement and communication strategies.

Expert review and evaluation provide a comprehensive assessment of the effectiveness and outcomes of CE efforts, allowing stakeholders to make data-driven decisions and optimize their strategies.

Case studies provide valuable insights into the impact of co-designed solutions, changes in business practices, and the integration of CE approaches in various industries. By examining case studies, stakeholders can learn from best practices, identify effective strategies, and gain inspiration for their CE initiatives.



Metrics

Enabling environment

Amount of financial resources allocated to CE
Usage rate of CE databases by stakeholders
Adoption rate of cleaner production practices and strategies
Revenue generated from resource-based taxation
Growth in the number of CE initiatives and projects

Market creation

Procurement spending on CE offerings
Market size and growth data for CE products/services
Market KPIs, e.g., increased production volumes
Adoption rates of sustainable practices in sectors
Sales and revenue generated by CE offerings

Organisational change

Revenue or market share attributed to CE offerings
Compliance rate with internal CE governance policies
Investments or savings from CE model adoption
Employee turnover rates related to CE principles

Surveys, interviews & focus groups

Challenges and benefits of adopting sustainability packaging standards
Feedback on the effectiveness of capacity-building programs
Assessment of the level of sustainability integration
Alignment of legislation, tax, and policies with CE goals

Enabling environment

Public awareness and understanding of CE principles
Development and support of communities of practice
Perceived improvements in supply chain capacity
Changes in people's practices
Perception and acceptance of CE offerings

Market creation

Stakeholder perceptions of the organisation's committment to CE
Employee feedback on relevance and effectiveness of CE training programs
Stakeholder feedback on CE initiative synergies

Organisational change

CE Implementation Data Framework

Case studies

Enabling environment

Impact created through co-designed CE solutions
Impact of minimising unintended consequences
Stakeholder alignment efforts
Policy interventions
Integration of CE into legal frameworks

Market creation

Integration of CE criteria in procurement practices
Market penetration of CE offerings
Integration of CE approaches into industries
Market-driven innovations

Organisational change

Recruitment strategies and impact on organisational culture
Impact of CE reporting on decision-making and accountability
Transition of incumbent actors towards CE practices

Expert review & evaluation

Barriers and enablers for accessing and utilising the available funding
Comprehensiveness of CE assessment frameworks
Impact of stakeholder commitments on CE implementation
Changes in business practices due to improved regulations

Enabling environment

Regulatory changes affecting the CE market
Influence of advocacy coalitions on CE-related initiatives
Cultural and organisational changes of institutionalizing CE practices
Environmental and social impacts of transformed practices

Market creation

Organisation's readiness for CE implementation
M&E processes for CE environmental impact
Cultural shift within organisations towards CE practices

Organisational change

Key Drivers and Enablers

Drivers

The transition to a CE in Victoria is a complex challenge that requires a multi-faceted approach. However, global, national and local forces are shaping Victoria's sustainability landscape. These CE-MAP drivers provide a starting point for further exploration and discussion of opportunities and challenges for CE in the State.

Climate emergency declarations by government bodies highlight a commitment to addressing the global climate crisis. Local councils are also driven by Victoria's goal of diverting 80% of waste from landfill by 2030. Policies and regulations on waste and resource recovery set standards and provide incentives for CE practices that can help achieve these targets. Moreover, the closure of local waste dumpsites increases the need for alternative waste management solutions that align with these targets and strategies.

Furthermore, growing consumer and community awareness and demand for sustainability create reputational pressures on businesses to take action on CE. Lastly, technological advancements in renewable energy, sustainable agriculture and resource recovery can provide new opportunities for CE development.

Enablers

CE-MAP enablers in Victoria will increase the focus on systems transformation towards CE and overcome systemic barriers that hinder the transition.

Funding mechanisms, such as grants and tax incentives, provide resources and investment that help overcome barriers to entry and support sustainable infrastructure and innovation.

CE intermediaries facilitate access to knowledge, expertise and resources to promote sustainable practices.

Strategies, policies and regulations create a level playing field, leading to a more competitive and sustainable business environment.

Collaboration, communication and cooperation are enablers that help co-create solutions and strategies, build stakeholder trust, and develop more effective solutions to complex sustainability challenges.

Technological innovation and development enable the development of new business models to promote the adoption of sustainable practices, such as sharing and subscription models.

CE education, training and skills acquisition help to raise awareness and understanding of sustainability challenges and opportunities among stakeholders.

Overcoming Blockages and Hurdles

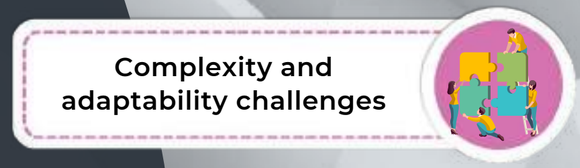
Potential challenges and limitations

While the CE-MAP offers a robust framework for stakeholders to guide their circular transition, it has challenges and limitations.

Implementing the CE-MAP may present stakeholders with various challenges due to the **complexity of the CE transition**. One significant obstacle is navigating the intricacies of interconnected systems within the CE-MAP. Stakeholders often face complexities in understanding the diverse interactions between environmental, economic, social, and policy factors. Additionally, the dynamic nature of the CE landscape demands adaptability from stakeholders as they encounter unforeseen obstacles and shifting market conditions. Adapting to emerging technologies, changing consumer behaviours, and evolving regulatory environments requires constant vigilance and flexibility.

Resource and capacity limitations can also hinder the smooth implementation of the CE-MAP. Stakeholders, especially small and medium-sized enterprises (SMEs), may face financial constraints when transitioning towards circular practices. The investment required to adopt new technologies, develop circular business models, and retrain the workforce can be substantial. Additionally, a lack of access to meaningful and complete datasets and expertise to understand and utilise such data can hinder stakeholders' ability to measure and monitor their circular progress effectively. Insufficient human resources and expertise in CE practices may slow the implementation process, making it essential for stakeholders to invest in building their capacities and collaborating with knowledgeable partners.

Successfully adopting the CE-MAP requires a **profound cultural shift** in how stakeholders approach business practices. Resistance to change, ingrained linear thinking, and risk aversion are common cultural barriers hindering the circular transition. Stakeholders may face challenges in gaining buy-in from leadership, employees, and other vital actors, so fostering a culture of innovation and collaboration is crucial. Moreover, forming effective collaborations between various stakeholders, including businesses, government bodies, academia, and communities, may prove challenging due to differing interests and priorities. Building strong partnerships and promoting open dialogue are essential to overcome collaboration barriers and drive collective action towards CE.



Improving implementation effectiveness

Stakeholders can improve the implementation effectiveness of the CE-MAP, drive continuous improvement and accelerate the transition towards a more sustainable CE by embracing the following approaches.

First, stakeholders must prioritise **continuous learning and knowledge exchange**. Embracing a culture of learning enables stakeholders to stay updated on the latest CE practices, emerging technologies, and industry trends. Regular workshops, seminars, and webinars facilitate stakeholder sharing of insights, best practices, and success stories. Furthermore, establishing knowledge-sharing platforms and communities of practice allows stakeholders to collaborate, ask questions, and seek guidance from peers, experts, and researchers. By fostering a culture of continuous learning, stakeholders can refine their strategies, adapt to changing circumstances, and identify innovative solutions for complex circular challenges.

Forming **collaborative partnerships and alliances** is another crucial step towards improving the implementation effectiveness of the CE-MAP. Stakeholders can achieve a more significant impact by joining forces with like-minded organisations, government bodies, academia, and civil society. Collaborative partnerships enable the pooling of resources, expertise, and knowledge, thus amplifying the collective efforts towards the CE transition. Stakeholders can co-create innovative solutions, share risks, and address systemic barriers more effectively. Moreover, partnerships can foster greater inclusivity, ensuring that diverse perspectives and voices are considered in decision-making. By building solid alliances, stakeholders can leverage synergies and achieve a more significant and lasting impact on CE initiatives.

Lastly, **data-driven decision-making and impact measurement** are essential components for enhancing the implementation effectiveness of the CE-MAP. Stakeholders should invest in robust data collection, monitoring, and evaluation mechanisms to accurately measure the progress of circular initiatives. Key performance indicators (KPIs) aligned with the framework objectives can provide stakeholders with actionable insights into the effectiveness of their strategies and interventions. Regular impact assessments help identify areas of improvement, celebrate successes, and communicate the outcomes to various stakeholders, including investors, customers, and employees. Using data to inform their decisions and measure their impact, stakeholders can make evidence-based adjustments, optimise their circular practices, and drive continuous improvement.

Application Scenarios

Guiding stakeholder action

The CE-MAP provides a comprehensive and structured approach to guide stakeholders' actions towards CE transitions. By emphasising collaboration, data-driven decision-making, and testing and piloting new initiatives, CE-MAP ensures a collective effort towards achieving a regenerative and sustainable CE for the present and future generations. This process necessitates a change in management processes and emphasises a step-wise approach to a broader transition.

The CE-MAP provides a structured approach for stakeholders to set clear CE objectives and outcomes. By understanding the interconnectedness of various factors, stakeholders can define targeted goals aligned with circular principles. The framework allows them to identify critical milestones and map a bespoke pathway towards achieving CE. This empowers stakeholders to focus on specific actions contributing to the overall transition, ensuring a coordinated and impactful approach.

The CE-MAP also serves as a roadmap for stakeholders to navigate the CE systemic landscape. It enables them to identify relevant actors, organisations, and institutions that share the CE vision. By recognising potential collaborators, stakeholders can foster partnerships and alliances to leverage collective knowledge, resources, and expertise. Collaboration across sectors and industries becomes more seamless as the CE-MAP provides a common language and framework for all stakeholders.

Guiding stakeholder action continued...

Within the CE-MAP, stakeholders can develop strategic and practical action plans that outline specific steps and initiatives for CE implementation. The CE-MAP guides stakeholders in assessing existing practices and policies, identifying gaps, and crafting solutions that align with circular principles. This comprehensive approach helps stakeholders create actionable roadmaps that address immediate challenges and long-term transformation, ensuring sustained progress in the CE journey.

A vital aspect of the CE-MAP is its emphasis on CE management strategy evaluation and data indicator frameworks. Stakeholders can use these tools to measure, monitor, and evaluate the progress of CE initiatives. By collecting relevant data, stakeholders gain insights into their actions' effectiveness, identify improvement areas, and celebrate successes. The CE-MAP's integrated approach to measurement ensures stakeholders have a holistic view of their impact on environmental, economic, social, and governance aspects.

The framework encourages stakeholders to foster a culture of knowledge sharing, reflection, and continuous improvement. By openly exchanging experiences, successes, and challenges, stakeholders can collectively learn from each other's endeavours and refine their strategies. The framework facilitates a feedback loop that encourages stakeholders to iteratively adjust their approaches based on evidence and insights, resulting in more effective and sustainable CE practices.

The CIRCLE program

The Custom Implementation Roadmapping for Circular Local Economies (CIRCLE) program represents a dynamic and collaborative initiative to drive tangible change in the CE. The project empowers businesses to transition successfully towards circular practices and contributes to a transformative CE ecosystem where stakeholders collectively shape a more sustainable future.

The CIRCLE project is dedicated to collaborating with businesses committed to driving real change and positively impacting the CE. The project fosters a strong network of stakeholders actively working towards a sustainable future by engaging with like-minded organisations. Central to the CIRCLE program's approach is the CE-MAP, which serves as a powerful diagnostic tool. By employing the CE-MAP, the program can assess the readiness of businesses for CE adoption, identify critical areas for improvement, and tailor strategies to their unique needs. This structured framework helps businesses comprehensively understand the challenges and opportunities they face on their circular journey.

The CIRCLE program facilitates co-creation workshops with participating organisations. These interactive sessions foster a creative and inclusive environment where participants collectively design innovative solutions, address complex challenges, and forge partnerships. The workshops catalyse generating actionable ideas and developing a shared CE vision for the organisation.

The CIRCLE program continued...

The CIRCLE program offers dedicated support in implementing bespoke CE roadmaps for participating organisations. By leveraging the insights from the CE-MAP and co-creation workshops, the program assists businesses in translating their aspirations into tangible action plans. These roadmaps outline clear steps and initiatives aligned with circular principles, enabling businesses to navigate their transition effectively and maximise their positive impact.

A learning and continuous improvement culture is fostered throughout the CIRCLE program's lifecycle. Regular reflection allows stakeholders to assess the effectiveness of strategies, identify barriers, and refine approaches based on evidence and feedback. The program actively disseminates its learnings, insights, and outcomes to a broader audience, contributing to a growing body of knowledge and inspiring systemic CE adoption.

The CE team at the Centre for Urban Transitions at Swinburne University of Technology delivers the CIRCLE program. The CE team can be contacted by emailing cutransitions@swin.edu.au

CIRCLE Project

Custom Implementation Roadmapping for Circular Local Economies

Conclusion and Bibliography

Concluding remarks

The CE-MAP stands as a robust framework that holds the potential to revolutionise the way we approach sustainability and circularity. Throughout this report, we have presented the CE-MAP and explored its significance in guiding stakeholder action, measuring progress, and driving CE transitions. Its versatility and adaptability make it a valuable tool for stakeholders across industries, academia, and government to co-create a more sustainable future.

Embracing the CE-MAP empowers stakeholders to set clear objectives and outcomes, align with the systemic landscape, and develop strategic action plans for CE implementation. The CE-MAP encourages stakeholders to work together and leverage their collective strengths to overcome barriers and challenges by fostering collaboration and inclusivity. It supports data-driven decision-making, enabling stakeholders to measure their initiatives' impact and identify improvement areas accurately.

As we progress, stakeholders must continue learning, reflecting, and refining their strategies based on the evolving CE landscape. Embracing a culture of continuous improvement and knowledge exchange will enable us to stay at the forefront of circular innovation and drive meaningful change. Collaborative partnerships and alliances foster cross-sectoral cooperation and create a unified front for driving circularity. By working together and sharing best practices, we can amplify our efforts and make a more substantial and lasting impact.

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