



Final Report Project 1.7, Stage 1

Collaborative planning for people navigating mine land transition: progress in Australia's Latrobe Valley

May 2024

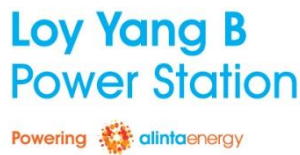
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CRC **TIME**
Transformations in Mining Economies

 Australian Government
Department of Industry,
Science and Resources

Cooperative Research
Centres Program

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ISBN 978-1-922704-31-3

Foran, T.^b, J. Reeves^a, K. Haque^a (2024). Collaborative planning for people navigating mine land transition: progress in Australia's Latrobe Valley. CRC TiME, WA, 6000. ISBN 978-1-922704-31-3

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Date of Publication

June 2024

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List of Abbreviations

AGL	:	Australian Gas Light Company
BAU	:	Business-as-Usual
BCA	:	Benefit-cost analysis
CJA	:	Capacity for joint action
CRC TiME	:	Cooperative Research Centre for Transformations in Mining Economies
DEECA	:	Department of Energy, Environment and Climate Action
DELWP	:	Department of Environment, Land, Water and Planning
DJPR	:	Department of Jobs, Precincts and Regions
DTP	:	Department of Transport and Planning
EC	:	Evaluation Criterion or Evaluation Criteria [Context Dependent]
ECR	:	Early Career Researcher
EES	:	Environmental Effects Statement
EPA	:	Environmental Protection Authority
FedUni	:	Federation University Australia
GLaWAC	:	The Gunaikurnai Land and Waters Aboriginal Corporation
GRAS	:	Gippsland Regional Climate Change Adaptation Strategy
LCP	:	Latrobe Collaborative Planning
LVA	:	Latrobe Valley Authority
LVMRAC	:	The Latrobe Valley Mine Rehabilitation Advisory Committee
LVRRS	:	Latrobe Valley Regional Rehabilitation Strategy
MCA	:	Multicriteria Analysis
MLRA	:	The Mine Land Rehabilitation Authority
MRSD	:	Mineral Resources Sustainable Development [Act]
PMLU	:	Post-Mining Land Use
RDA	:	Regional Development Australia
RDV	:	Regional Development Victoria
TAFE	:	Technical and Further Education

1.0 Executive Summary

This report documents progress towards the development of a shared vision for the future land use of mine land in Victoria’s Latrobe Valley. Facilitating people whose lives or livelihoods are associated with the Latrobe Valley to articulate such a vision is the aim of the Latrobe Collaborative Planning (LCP) research project.

Supported by CRC TIME and partners, the project is organised into two stages. Stage One (2023–2024), the focus of this report, involved initiating and deepening a unique collaboration among state and local government, Indigenous, industry, and community organisations. The focus of collaboration in Stage One has been the co-development and trial assessment of post-mining land use scenarios using participatory multicriteria analysis.

Written for an audience of scholars and practitioners in regions undergoing mining-related transition, this report describes methods and techniques used by the project to:

- review values expressed by Latrobe Valley’s regional development actors
- elicit values of project participants associated with post-mining land use
- formulate and evaluate three alternative land use scenarios, which embody varying distributions of the above values
- facilitate dialogue and deliberation during participant workshops.

We also report on changes in collaborative dynamics observed during Stage One, focusing on changes among participants with formal responsibilities or declared interests in mine closure and rehabilitation (the ‘core’ participants of Stage One).

Three exploratory scenarios crafted by the study team present alternative snapshots of the Latrobe Valley in 2050. Each consists of contrasting, stylised combinations of future states, whose outcome in 2050 cannot be predicted: (a) the degree to which energy and energy-related industry are concentrated in the Valley; (b) the degree to which its regional transition is guided by principles of social equity; and (c) the degree to which transition is guided by principles of sustainable production and consumption (eg circular economy):

IMAGINED FUTURE OUTCOMES (2050)			
UNCERTAINTY	SCENARIO 1 BUSINESS-AS-USUAL	SCENARIO 2 BIOECONOMY	SCENARIO 3 NEW ENERGY
(a) Concentration of energy & related industry	Low	Medium	High
(b) Regional transition as socially equitable	Low	High	Low
(c) Regional transition founded on sustainable production & consumption	Low	High	Medium

Source: Authors.

We translated the three exploratory scenarios into quantified post-mining land use (PMLU) scenarios by interviewing each mine operator, to determine which parcels (excluding mine voids) could, once rehabilitated, potentially support different types of PMLU. This included eliciting information about site assets, constraints, and existing commitments (eg biodiversity conservation, recreation). Each PMLU scenario was a portfolio of 13 land use types (with each type supporting one or more social values).

The Stage One participants then conducted a multicriteria analysis (MCA) of the three PMLU scenarios. The MCA technique first involved scoping and defining a set of evaluation criteria. Each criterion serves as an indicator of one or more social values. Participants contributed to formulating the evaluation criteria, then later assigned subjective weights to each criterion. In parallel, the study team conducted a rapid evaluation of the performance of each scenario against a set of 18 evaluation criteria. This activity was conducted independently of the subjective weighting activity. We then visualised the performance of each scenario, as a scatterplot of final 'utility scores', with each score corresponding to the evaluation criteria as weighted by one participant. The visualisation technique supported a group discussion and short deliberation about the relative performance of each scenario, conducted during the final workshop of Stage One (November 2023).

Participants in this pilot assessment preferred the Bioeconomy scenario and the New Energy scenario over Business-as-Usual (BAU). Compared to BAU, the two alternative scenarios provide more of the types of land use which align with participants' values. However, participants recognised that unless the community and responsible actors could help realise either of these scenarios, the region would be left with lower valued outcomes, as represented by BAU.

The motivation for people to collaborate across the boundaries of governmental and private sector organisations, is to achieve a purpose which cannot otherwise be achieved through other instruments or forms of governance – in this case, for the purpose of constructing a shared vision of post-mining land use. To support collaborative planning, the study team offered a participatory process which was iterative; incremental; dialogic and adaptive (responding to strongly held concerns); and oriented to place-based social values.

We assessed the quality of participant (and study team) interactions during Stage One based on an evaluation approach associated with the 'integrative framework of collaborative governance' (Emerson & Nabatchi, 2015a). The framework presents collaboration as emerging under particular conditions (including recognition of interdependence, and initiating leadership). Collaboration is seen as working via processes of communicative behaviour ('principled engagement'); and inclusive, trustful, and dedicated relations ('shared motivation'). Each of these processes is enabled by – and enables - the 'capacity for joint action' (which refers to leadership, resources, internal organisation, and knowledge). We used survey data as well as meeting and workshop notes, and personal communications to the study team, to evaluate changes to principled engagement, shared motivation, and capacity for joint action.

The collaboration in Stage One focussed on knowledge production. Knowledge was co-produced between the study team and participants, for example, mine operators shared site-specific land suitability data; participants discussed their values; experts articulated particular visions for regional development. These components allowed a participatory multicriteria analysis of PMLU scenarios to occur. A key finding is that such knowledge co-production deepened collaborative dynamics, allowing synergistic gains in principled engagement and shared motivation. (These gains were observed among the 'core' set of participants in Stage One, who at the request of the study team, participated more intensively in project scoping and specialist knowledge generation.) In turn, the knowledge generated through synergies in communicating and relating, augment the capacity for joint action in Stage Two.

The report discusses the usefulness and limitations of the scenario-based planning method, with implications for design of the deliberations planned for Stage Two (2024-2025), which are intended to be representative of Indigenous residents, of youth, and of the region’s population.



Figure 1: Hazelwood mine void in November 2023

2.0 Introduction

Project aims & motivation¹

The research project *Collaborative Planning for Post-Mine Land Use in the Latrobe Valley* (‘Latrobe Collaborative Planning’; ‘LCP’) aims to develop by 2025, a shared vision and a framework for future land use for Victoria’s Latrobe Valley mine lands, after the cessation of coal-fired power generation.

By land use *vision*, we refer to a spatially explicit portfolio of land use (LU), which participants in the project have reason to value (eg, for its ability to support a range of desired economic, environmental and social functions and activities), and consider feasible (where feasibility refers to compatibility with biophysical constraints). As of 2024, a shared post-mining land use (PMLU) development vision does not exist to guide and mobilise rehabilitation planning and future economic development investment for the Valley.

By ‘framework’ we refer to a methodology by which LU visions could be formulated – that is, concepts, methods, and specific techniques which, based on application in the Latrobe Valley, may deserve consideration

¹ This Section builds on Foran and Reeves (2023) and Foran et al. (in review).

for ongoing use in regions transitioning from coal-fired power generation, or indeed other major extractive industry.

The Latrobe Valley's three brown coal mines are closed or slated for closure by 2035 (ENGIE Hazelwood mine and power station, 2017; Energy Australia Yallourn mine, 2028; and AGL Loy Yang mine, 2035), although Alinta has the option to extend operation of the Loy Yang B station to 2048. Significant focus has been devoted to economic transition support for mine and power station workers (Weller, 2019). By contrast, processes by which options for post-coal era economic development of mine land are formulated, are perceived by stakeholders² as insufficient (Foran, 2022; Reeves, Morgan, Reimers, Baumgartl, & Green, 2022). This transformation of coal mine land into land ready for a variety of re-development uses is a planning challenge with several intertwined dimensions:

Long-term & multi-stage planning. Land re-development will occur over a (multi) decadal scale. A comprehensive institutional framework which covers mine closure, rehabilitation, and redevelopment does not exist. Existing institutional arrangements focus on mine closure and landform rehabilitation. Mine licensees are responsible for delivering post-mining *landforms* which are safe, stable, and sustainable, prior to relinquishment. ('Landform' refers essentially to final physical structures of mine voids as well other land in a mining tenement). However the topic of *land use* (ie the functions and values which are actually realised on a set of post-mining landforms) is to a significant degree determined by those who will redevelop that land (ie land managers and/or owners). The identity, values, and interests of future land owners and managers are subject to change during long period between mine closure and re-development.

Diverse perspectives and interests. Diverse perspectives exist with regard to how final landforms will be realised. The current mine operators believe that filling the mine voids with water is the only practicable solution to meeting safety and stability standards. Other stakeholders and rightsholders have expressed concerns about detrimental impacts on environmental, social, and cultural values if Latrobe river system water were used to rehabilitate mine voids, particularly in the context of a drying climate (eg DEECA, 2023; Environmental Justice Australia, 2023; Hale, Boon, Lloyd, Vietz, & Jempson, 2020).

Complex decision-making processes with modest space for public participation. The mine closure planning policy regime in Victoria distributes authority and responsibility among multiple government agencies and private parties (Foran, 2023). Before 2019, opportunity for Latrobe Valley community and other segments of civil society to influence post-mining LU planning decisions was relatively modest. However, several policy instruments introduced since that time may offer expanded opportunities:

(i) Changes to mining regulations. Under the Mineral Resources (Sustainable Development) ['MRSD'] Act 1990 (State of Victoria, 2021) statutory mine closure planning is governed by a proponent-led model. Individual licensees in the Latrobe Valley propose post-mining landforms and closure criteria as part of 'declared mine rehabilitation plans'. Proponents are expected to conduct community consultation for at least 60 days around final landform and implications for PMLU of their post-mining landforms (DEECA, 2023).

² Despite its frequent use in policy and everyday discourse, the term 'stakeholder' does not adequately recognise the prior and pre-eminent status of Australia's First Nations. Elsewhere in this report, 'rightsholder' denotes Indigenous rightsholders.

(ii) Mine closure plans must also conform to requirements of Victoria’s Planning and Environment Act, its Environmental Effects (EE) Act, and potentially the federal EPBC Act, including the Water Trigger. An Environmental Effects Statement (EES) is an instrument under the above Acts. ENGIE Hazelwood has been directed to assess the direct, indirect, and cumulative effects of its preferred final landform (and alternative options) on biodiversity, cultural-heritage, ecological, environmental, and socio-economic values, under an EES process (DTP, 2024). This appears to constitute the first application of EES to guide mine rehabilitation decision making in Australia (Foran, Ackermann, & Barber, in review). The final determination will be made by the state government, informed by key departments, such as DEECA. The Hazelwood mine rehabilitation plan must also satisfy any conditions set by the federal environment minister, pursuant to review under the EPBC Act.

(iii) Development of regional rehabilitation strategy. The Latrobe Valley Regional Rehabilitation Strategy (LVRRS) is an ‘integrative’ policy instrument developed to work under the MRSD Act (Hamblin, 2022). It is an evolving policy and planning initiative, coordinated by agencies responsible for earth resources regulation and for water (within Department of Energy, Environment and Climate Action since January 2023). An independent agency, the Mine Land Rehabilitation Authority (MLRA), was established in 2020 to perform monitoring and evaluation functions, providing assurance to the public that licensees and public agencies are planning for rehabilitation. A related duty of MLRA is to promote participation of Latrobe Valley community and stakeholders in implementation of the LVRRS.

One intent of the LVRRS is to provide an overarching framework for ensuring that values of the wider community are part of rehabilitation planning.³ However, the LVRRS has not yet designated a planning process by which community values related to PMLU could be integrated with concerns about biophysical safety and stability (values at the core of mine closure planning), yielding options for consideration and eventual choice by Traditional Owners, the community, licensees, and government.

The LCP project responds to the need for processes which acknowledge the above planning and governance challenges. It specifically aims to design and test a mechanism involving a multi-stakeholder deliberation on preferred post-coal-era development options for mined lands of the Latrobe Valley. The deliberation considers financial, economic, environmental, social and cultural impacts of alternative options. Participatory multicriteria analysis supports option formulation. If proposed and assessed with diverse and rigorous community and multi-stakeholder participation, such options could include noteworthy and potentially novel bundles of economic and non-economic values (eg improving supply of affordable housing; economic diversification via new industries, biodiversity corridors). If it proves viable, the deliberative planning process could form part of the policy mechanism currently missing. The lack of such mechanism is a limitation in current institutional arrangements.

³ This intent is expressed in a series of principles and guidelines for rehabilitation. Likewise, the Strategy explicitly supports identifying practicable and intended land use for rehabilitated landforms (DJPR & DELWP, 2020; Gardner, Poletti, Downes, & Hamblin, 2022).

This report

Stage One of LCP (2023 to 2024) focussed on fostering collaborative dynamics among a core set of stakeholders and rightsholders with declared interests in the Valley's mine-associated transition issues. These 'Stage One participants' include mine licensees and/or power station operators; key regulatory and planning agencies; and a subset of civil society or community groups (Annex 1).

Although factors which enable and constrain potential collaboration among the above actors are largely beyond the control of a research project such as LCP, scholars of collaborative governance believe that desired patterns of communication and relating among participants can be fostered through activities such as deliberative planning.

Written for an audience of scholars and practitioners in regions undergoing mining-related transition, this report describes methods and techniques used by the project to:

- review values held by Latrobe Valley stakeholders and rightsholders (as communicated in a range of literature)
- iteratively formulate alternative PMLU scenarios through co-design to support realisation of those values
- facilitate dialogue and deliberation during participant workshops.

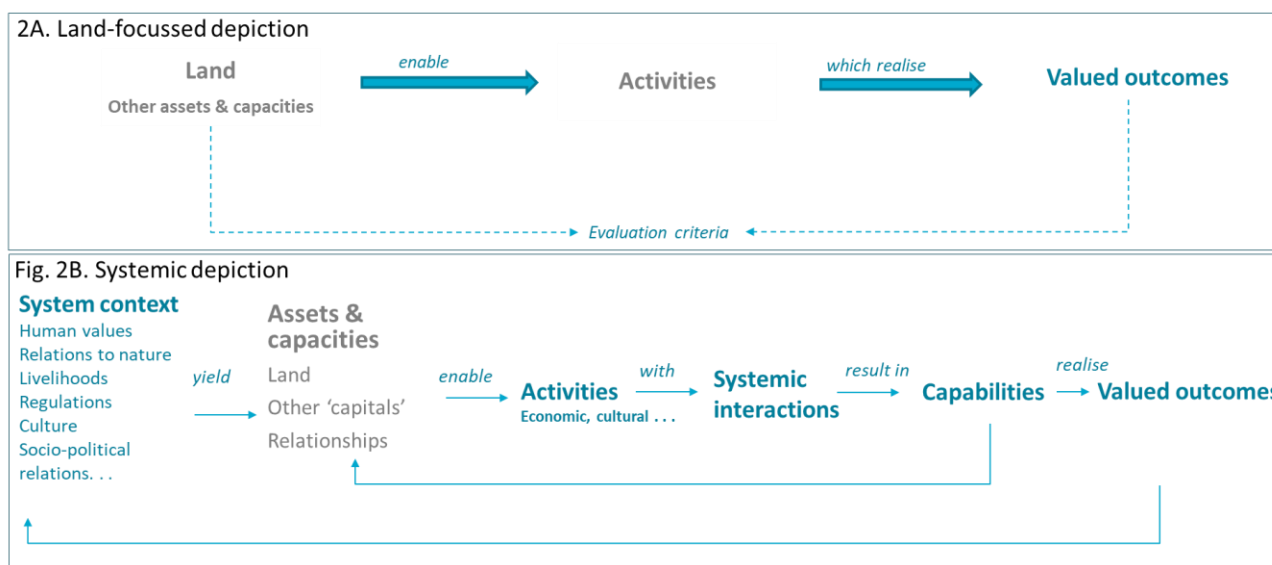
We report on preferences of Stage One participants for particular PMLU outcomes, and their initial perspectives on how such outcomes could be better enabled. We also report on observed changes in collaborative dynamics among the Stage One participants.

3.0 Methodology

3.1 Conceptual foundations

3.1.1 Post-mining land use and the realisation of valued outcomes

We consider rehabilitated mine land to be an asset: in conjunction with other assets and capabilities, land enables various human activities and ecological functions. Through such activities and functions, various social values may be realised (Figure 2A). However, land-based activities occur in a complex system context. Some elements of this system context include ecosystems; patterns of public and private resource ownership; human values; decision-making processes through the mining life cycle; and evolving social, economic, and political relations in regions. In the above system, interactions between biophysical and socio-economic elements may give rise to problems of public concern. The Latrobe Valley’s mine rehabilitation challenges are a case in point.



Source: Authors. The link between activities and outcomes is mediated by systemic interactions which produce a distribution of human capabilities to realise valued outcomes.

Figure 2: Land use and the realisation of valued outcomes

At the same time, the working of social and economic processes produces and distributes human capacity (ie potential), together with land and other assets, to segments of society. Human *capability* is the substantive ability of a group, given its capacities, to pursue outcomes it values. Examples include capability to be healthy, to care for Country, to be recognised politically, to participate in decision-making.

The primary focus of LCP is on land as a vehicle for the above types of valued outcomes (Figure 2A). A comprehensive analysis of the factors mediating and intervening between land development and the realisation of desired outcomes (Figure 2B) is beyond scope of the project. However, the importance of systemic forces on desired outcomes, and the participatory, multi-stakeholder design of the project suggest both a need, and an opportunity, to increase awareness of systemic complexity. For example, in Stage One of the project, the study team used qualitative long-term regional development scenarios to create three contrasting future ‘snapshots’

of the Latrobe Valley. These scenarios (Section 3.5) invite participants to reflect further on which forces might continue ‘business-as-usual’ outcomes; how different system forces might lead to alternative futures; and which systemic reforms might be required to realise desired futures.

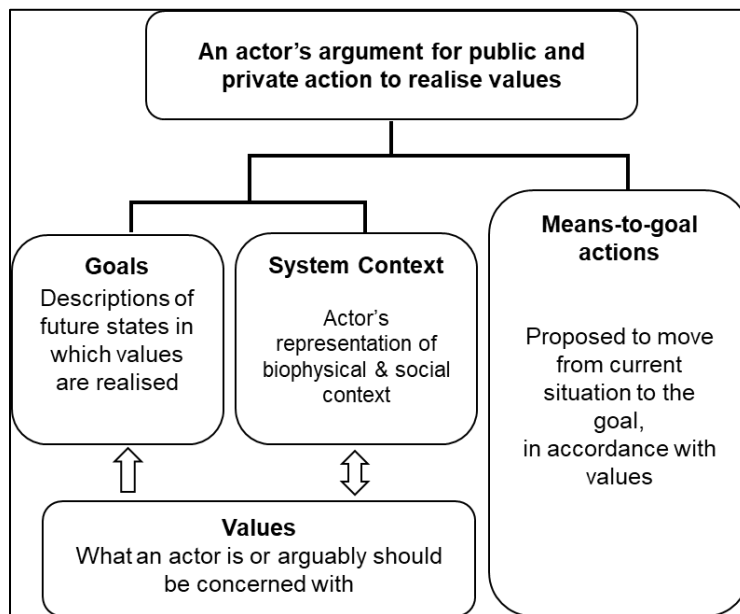
3.1.2 Values and policy argument

The LCP seeks to support diverse participants to craft a vision for PMLU, one which the current operators and other core stakeholders consider feasible, and can agree on. When different actors articulate their preferred post-mining landform, or their post-mining LU vision, we understand them to be engaging in policy argument. (The concept of policy argument however extends beyond claims voiced by different interested parties, to arguments which are embedded in legislation and other expressions of public policy, and can be reconstructed through argumentation analysis.)

The concepts of value and policy argument are central to the project’s conceptual framework. The concept of value essentially refers to ‘what matters’ – that is, matters of persistent concern (cf. Fairclough & Fairclough, 2012), or ‘relatively enduring conceptions of ‘the good’ (Brown, 2000). Such conception can be abstract (eg recognition justice for First Nations people) as well as relate to specific attributes of a place (eg the biodiversity or economic values of a landscape).

A policy argument is a claim for public action, based on an actor’s values, goals, and their assessment of the context which justify taking action (Figure 3) (Fairclough & Fairclough, 2012).

Representations of biophysical and social context (ie factual claims) inform argument.



Source: Authors, adapted from (Fairclough & Fairclough, 2012; Foran et al., in review)

Figure 3: Policy argument

3.1.3 Collaborative governance

The ability of participants to agree on such a ‘vision’ is by no means an assured outcome. Conceptually, we see the emergence of such a vision as occurring via processes of argumentation among participants. The ‘vision’ itself constitutes a collectively crafted policy argument. To understand how actors with diverse interests might work together to craft a PMLU vision, we turn to scholarship on collaborative governance (Emerson, 2012). Emerson et al. define collaborative governance as:

Processes and structures of public policy decision-making that engage people constructively across the boundaries of public agencies, levels of government, and/or the public, private, and civic spheres in order to carry out a public purpose that could not otherwise be accomplished.

Emerson et al., 2012: 2

A public purpose is one in which the orientation is towards addressing problems which have a public dimension as opposed to a narrower set of issues affecting a specific type of organisation (Emerson and Nabatchi, 2015: 19). For example, although the Latrobe Valley mine land is privately owned, the redevelopment of former mine land to provide common goods or services (such as parks or restored ecosystems) constitutes a public purpose which may induce a range of private and public actors to work together.

Drivers of collaboration. The presence of one or more of the following factors is thought to spur collaboration (Emerson & Nabatchi, 2015a):

- uncertainty
- interdependence
- consequential incentives
- initiating leadership.

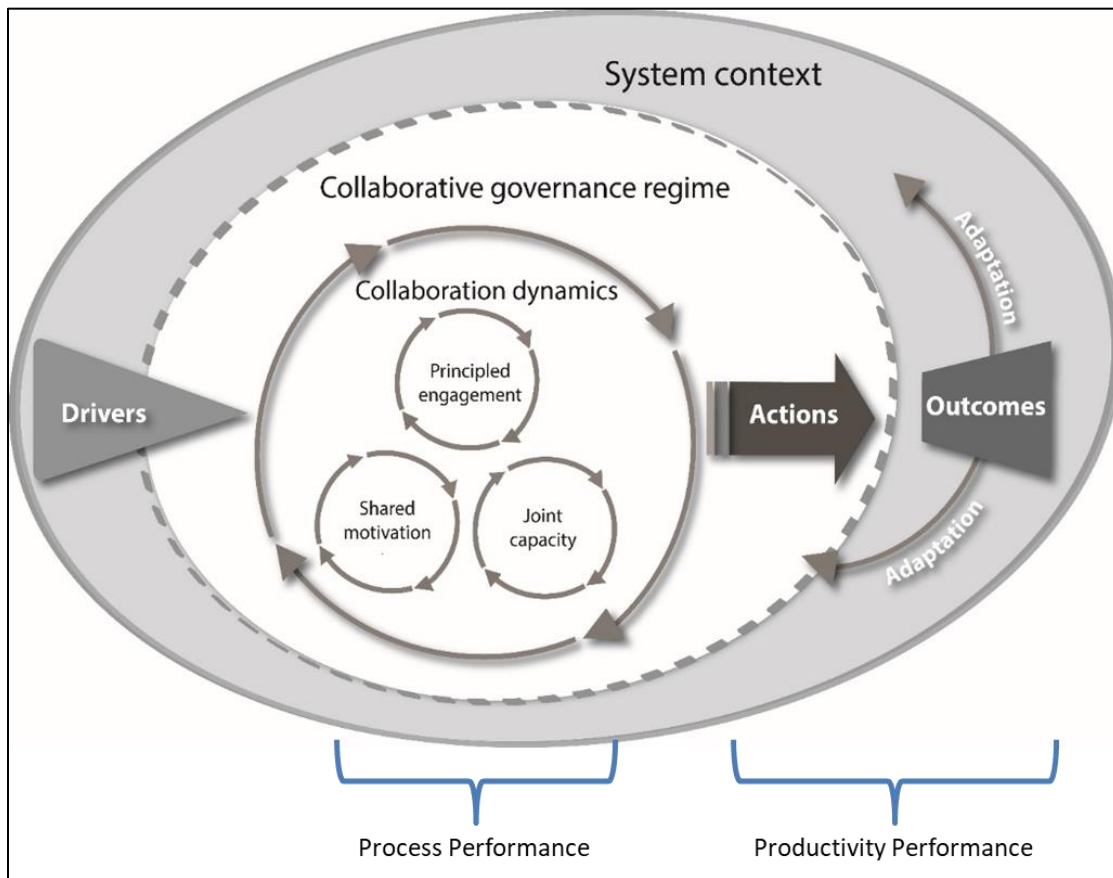
Section 4.2 summarises how these drivers emerged from the system context during Stage One of LCP.

Collaborative dynamics. Emerson et al. (2012) describe collaborative governance as working via three social processes with (a) behavioural; (b) interpersonal; and (c) organisational and resource-related dimensions (Figure 4).

Each or process may interact in a virtuous cycle with the others over time:

- ‘Principled engagement’ refers to behaviour (especially cognitive and communicative behaviour), that leads to participants understanding each other’s interests and defining areas of shared interest. Principled engagement requires initial levels of trust. It emerges through the ability to communicate using reasoned argument, and to engage in deliberation focussed on defining problems and finding agreement together.
- ‘Shared motivation’ refers to interpersonal interactions that build trust, foster mutual recognition of interdependence, establish shared ownership, and create a sense of internal legitimacy.
- ‘Capacity for joint action’ refers to types of ‘functional assets’ which are required to support collaborative action: institutional arrangements; various kinds of functional leadership; ability to access high-quality information; and the ability to acquire other types of resources.

Through the lens of collaborative governance, the craft of constructing a shared PMLU vision requires principled engagement, which is spurred on by shared motivation, and supported by capacity for joint action.



Source: Authors, based on K. Emerson and Nabatchi (2015a, 2015b).

Figure 4: Integrative framework for collaborative governance

Assessing collaborative dynamics. Table 1 to Table 3 below are based on a framework for evaluating the performance of collaborative governance (Emerson & Nabatchi, 2015b), specifically, the ‘process’ components of: principled engagement, shared motivation, and capacity for joint action.

Table 1 to Table 3 provide examples of evaluation indicators and data sources relevant to collaborative dynamics. For these indicators, potential data sources consist of archival data (eg meeting minutes, reports, case documentation); surveys or interviews; and direct observation.

Table 1: Principled engagement

ELEMENT	DEFINITION	SAMPLE INDICATORS
Discovery	Identification and analysis of relevant information	Extent to which participants reveal interests, concerns, and values; recognize shared goals; recognize how their own interests are served by participation in group; identify, share, and analyse relevant information

Definition	Effort to build shared meaning around issues relevant to LCP	Extent to which participants articulate common purpose and target goals; define concepts and terminology; clarify tasks and expectations; develop evaluation criteria
Deliberation	Use of candid and reasoned discussion to address issues	Extent of engagement in fair and civil discourse; open and inclusive communication; candid and reasoned discussion; offering of individual opinions; listening; examination of diverse perspectives; management of disagreement; willingness to change perspective
Determinations	Decisions reached by LCP and its working groups	Explicit agreement on collective purpose, target goals, shared pathway to impact

Source: adapted from Emerson and Nabatchi (2015a).

Table 2: Shared motivation

ELEMENT	DEFINITION	SAMPLE INDICATORS
Trust	Confidence in reliability, truthfulness, & abilities of others	Extent to which participants believe each other to be reasonable, predictable, and dependable
Mutual understanding	Understanding & tolerance of differences	Extent to which participants identify and respect differences among each other; are comfortable revealing information to others; appreciate and feel appreciated by others
Internal legitimacy	Beliefs about worthiness & credibility of LCP & its participants	Extent to which participants deem LCP and its parties to be useful, worthy, and credible
Commitment	Dedication & responsibility to LCP purpose, target goals, shared pathway to impact	Extent to which participants are committed to LCP, its collective purpose, target goals, and shared impact pathway; are motivated to achieve outcomes together; feel responsible and accountable for outcomes

Source: adapted from Emerson and Nabatchi (2015a).

Table 3: Capacity for joint action

ELEMENT	DEFINITION	SAMPLE INDICATORS
Procedural or institutional arrangements	Protocols for managing sub-components over time	Extent to which arrangements enable effective administration and management of LCP (eg supports synergistic interactions between component activities)
Leadership	Functional positions served by participants	Types of leadership roles filled/unfilled (eg champion, convenor, facilitator, expert)
Knowledge	Knowledge required to position organisation to take joint action, including processes for sharing w/participants & accessing expertise	Degree to which high-quality information made accessible to participants (eg mine land suitability for PMLU) Ability to (co)produce useful knowledge (eg PMLU scenarios)
Resources	Acquisition of resources needed to achieve organisation's purpose	Extent to which funding, administrative support, expertise, tools, and other resources were acquired Extent to which parties contributed to and leveraged various resources Extent to which parties accommodated differences in resources and capacities of others

Source: adapted from Emerson and Nabatchi (2015a).

3.2 Facilitating & evaluating collaborative dynamics

The project used a variety of participatory methods and techniques to support 'principled engagement' and 'shared motivation' dimensions of collaboration.

The methods and techniques were implemented in 2022–2023 through a series of workshops and preparatory meetings, which together embody a number of cross-cutting and mutually-reinforcing elements:

- Face-to-face communication – all meetings were face-to-face with option of online participation.
- Incremental approach – meetings used an incremental and coherent series of activities to build rapport help discover and define project scope; and refine the analytic pathway.
- Iterative approach – meetings offered participants to multiple opportunities to engage with topics, including controversial topics (Section 4.1).
- Dialogic and adaptive approach – meetings allowed participants with strongly held concerns to communicate their positions, with the study team making adaptations to such concerns and interests (Section 4.1).
- Values-oriented approach – each workshop provided an opportunity to consider procedural or substantive values.

3.2.1 Inception phase conversations

During the proposal development and initial phases of this research project (2022–early 2023), the study team met individually with the organisations invited to participate in Stage One of the project to understand their concerns, constraints, and aspirations, as well as seek their support for the project.

A sub-set of participants were considered ‘core’ stakeholders on the basis of their formal responsibilities for mine rehabilitation and regional development. These included mine operators; selected local and state government departments with; and community groups with an understanding of concerns and aspirations for community members of the Latrobe Valley (see Annex 1).

Information from these meetings helped inform preliminary project design including matters of scope, confidentiality, and data sharing, in advance of multi-stakeholder activities. This enabled a level of rapport to be established prior to commencement of workshops.

3.2.2 Participatory workshops

Four workshops provided opportunities for participants to engage with issues in an iterative manner. Workshops 1 and 2 were designed for organisations with direct responsibilities for mine rehabilitation and for regional development. Most of these organisations had contributed leadership and other resources to initiate the project and served on the project Steering Committee (Annex 1). For Workshops 3 and 4, the participant pool was successively broadened to include organisations with declared interests in Latrobe Valley’s development. Stage One participants include a majority of the organisations listed as ‘Advisors’ in Annex 1.

Table 4 shows the sequence of activities designed to support collaboration.

Table 4: Participatory activities

ACTIVITY	PARTICIPANTS	FOCUS
Inception interviews	Steering Committee members Selected Stage One participants	Discovery (<i>sensu</i> Table 1)
Workshop 1 (May 2023)	Steering Committee members	Project scope Objectives Project principles
Workshop 2 (August 2023)		LU Planning principles
Workshop 3 (October 2023)	Stage One participants	Values (post-mining regional development)
Workshop 4 (November 2023)		Evaluation of PMLU scenarios

Source: Authors. Note: Steering Committee members are a subset of the Stage One participants.

Workshop 1 (29 May 2023) addressed foundational topics: the project’s topical and geographic scope; achieving greater clarity around shared objectives; and discussing a proposed set of ‘shared principles’ (ie. normative expectations) for the project. Ten participants were present, most of whom were members of the steering committee or another delegate from their organisation.

The **second workshop** (25 August 2023) invited participants to develop ‘planning principles’ which would inform the subsequent formulation of PMLU scenarios. Participants also discussed a tool under development by the study team, to estimate the economic value of different PMLU scenarios (as an input to deliberation around preferred scenarios) (Cruse, Leishman, & Pilat, 2023).

The **third workshop** (27 October 2023) invited participants to discuss their values associated with post-mining regional development, and evaluation criteria (ie indicators and metrics) potentially applicable to a multicriteria analysis (MCA) of PMLU scenarios. Building on themes revealed in the high-level review of community consultation reports, a selection of values were identified and explored through a co-design workshop utilising a World Café approach (Löhr, Weinhardt, & Sieber, 2020). The 24 participants were asked to define what each of the values meant to them and consider how these might be realised on the sites. As a second exercise, participants were asked to consider the two future land use scenarios: Bioeconomy and New Energy, and what activities these might entail on the sites. Each group had the opportunity to reflect on another group’s response and add their own comments.

Workshop 4 (November 2023), the final workshop of Stage One, focussed on multicriteria analysis (MCA). Three exploratory PMLU scenarios developed by the study team were assessed against a set of evaluation criteria (which participants in Workshop 3 had contributed to defining). Twenty-five participants assigned (on an individual capacity) subjective weights to each criterion. Participants also viewed the resulting performance of each scenario (using methods detailed in Section 3.6) and discussed the implications of the MCA technique for Stage Two.

For all workshops, the format allowed for online breakout groups and moderated chat, to ensure inclusion. After each of the workshops, presentations and notes of key outcomes were provided to participants. (Participants were advised that these documents could be shared within their organisation, but should be considered working documents of the project.) Post-meeting conversations were held independently with most participants to understand their positions and to respond to unresolved or emergent issues.

3.2.3 Evaluation

Collaborative dynamics were evaluated during Stage One by analysis of meeting and workshop outcomes; participant e-mail communications; and notes of telephone communications with the study team. After each workshop, the team also invited participants to respond anonymously to a ten-question survey instrument. The instrument focussed on the ‘principled engagement’, ‘shared motivation’, and ‘capacity for joint action’ components of collaborative dynamics (Annex 4).

3.3 Review of regional development strategies

The study team conducted a review of more than a dozen regional development strategies or plans for the Latrobe Valley and Gippsland, published between 2015–2023 (Annex 2). The review focussed on identifying regional development priorities, as well as specific visions for post-mining land use, thus providing contextual support for

PMLU scenarios formulated by the project. Findings of this review are available in two separate reports (Haque, Reeves, & Foran, 2024, n.d.).

3.4 Reviewing social values

Community values are conceived by this project to be concepts gaining meaning and importance in a community through justification, dialogue, deliberation and engagement between citizens and stakeholders.

The Latrobe Valley is considered one of the most over-consulted and yet underheard communities in Australia (MLRA, 2024). Numerous reports have been published over the past 20 years which have captured various aspects of the community's concerns and aspirations for the future of the Valley. A summary of studies containing values of particular relevance to mine land and rehabilitation was prepared by MLRA (2024).

Two recent visioning outputs produced with extensive community consultation are: the *Latrobe Community Vision Panel Report*, produced by Latrobe City Council (herein, 'Latrobe Community Vision')(Capire, 2021); and *Gippsland 2035 Latrobe and Gippsland Transition Plan* (herein, 'Gippsland 2035'), produced by Latrobe Valley Authority (2023). We conducted a manual content analysis of values in the following sections of these documents:

- The vision statement table in *Latrobe Community Vision*
- The 'Guiding principles' and 'Recommendations' sections of *Gippsland 2035*.

The manual content analysis was conducted in an iterative manner with coding guided by discussions among the research team, and implemented in NVivo software.

Three categories of values adapted from Foran et al. (2022) were applied. The categories are not mutually exclusive:

Place-related values includes the sub-categories: *biodiversity or ecosystem services; cultural or spiritual values; intrinsic value; legacy, historical or regional identity; recreational value; and economic value*. The latter sub-category consists of *entrepreneurship or economic innovation; and housing or urban development*.

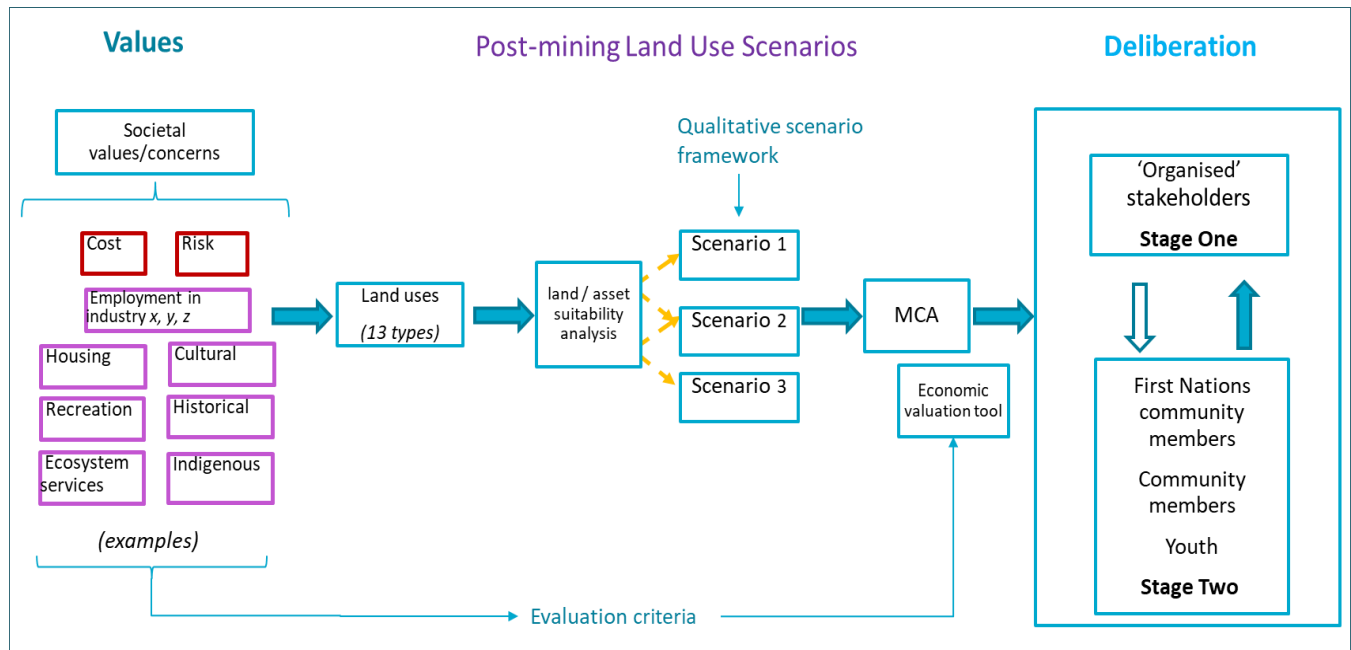
Industrial sectors, a complementary way to classify economic values, captures what types of industries were mentioned in the two documents.

Non-place-related values included concepts such as effectiveness; efficiency; distributive justice; procedural justice; recognition justice; and values pertaining to socio-economic conditions (eg economic security for workers).⁴

⁴ For an introduction to distributive, procedural, and recognition justice, see Miller (2023).

3.5 Formulating post-mining land use scenarios

We define a PMLU ‘vision’ as a spatially explicit portfolio of land use (LU), which participants in the project have reason to value, and consider feasible. This section describes the formulation of alternative PMLU portfolios of post-mining land use, based on exploratory scenarios.



Source: Authors.

Figure 5: Formulation of values-based PMLU scenarios

3.5.1 Categories of post-mining land use

The PMLU scenarios consisted of alternative combinations of eight broad categories of land (or activity enabled by a category of land). The eight categories below were defined based on correspondence to regional development priorities, and the values and aspirations of participants discussed at Workshops 2 and 3 (and Steering Committee 2).

Regional development priorities were based on literature reviewed (Annex 2; Haque et al., 2024) and as expressed by specialists associated with government agencies such as Latrobe Valley Authority, Latrobe City Council, Agriculture Victoria.

- New Energy (eg wind, solar, geothermal, battery storage)
- Industrial (heavy and/or light industrial)
- Recreational (active – requiring built infrastructure, such as stadiums or higher impact, eg dirt bikes, and passive – tracks and trails for walking, mountain bikes, potentially horses)
- Biodiversity conservation and enhancement (maintain conservation areas, develop wildlife corridors)
- Cultural values and enhancement (both Indigenous and historic)
- Food and Fibre (grazing, cropping, horticulture, plantation timber, food manufacturing)
- Residential (eg mixed density, social and affordable housing, lifestyle properties)

- Institutional (eg educational and health facilities, museum, art gallery).⁵

The study team subsequently elaborated the eight broad categories into 13 types of post-mining land use (see Table 6 below).

3.5.2 Exploratory scenarios

Three exploratory scenarios were developed by the research team to support deliberation on a preferred post-mining LU vision. Exploratory scenarios were introduced to participants as simplified representations of how the future could look. Rather than serving as projections, their purpose is to stimulate discussion about possible future outcomes, including a mix of dynamics which are desired and undesired.

Scenario framework

Scenarios were developed first by establishing a qualitative framework. An initial framework was presented and discussed at Workshop 2. The initial framework consisted of a 'Business-as-Usual case' (BAU), and an 'Alternative case', with the latter representing an aspirational future in which a suite of economic and extra-economic values were realised to a more profound degree than BAU. The study team subsequently elaborated on the initial scenario framework by selecting three driving forces whose future outcome in 2050 is uncertain. This timeframe was selected on an assumption that a significant proportion of non-void mine land would be rehabilitated by 2050, prior to and in parallel with mine void rehabilitation. This was deemed a reasonable assumption by the project steering committee. We then selected three sets of stylised future outcomes across the possibility space (Table 5):

- Concentration of energy and related industry
- Degree to which regional transition is guided by principles of social equity
- Degree to which the regional transition is guided by principles of sustainable production & consumption.

Taken together, the three uncertain driving forces and the resultant framework emphasise that the future of the Latrobe Valley is beyond the control of stakeholders and policy-makers within the region. Rather, it hinges on a complex system of social (broadly defined) and biophysical factors, including economic growth, technological development, and capability to develop new business and organisational models.

⁵ In actuality, the development of future land uses would require rezoning of the land. Notably a 'State Resource Overlay' currently exists which prioritises utilisation of coal resources, and hence restricts alternative land uses.

Table 5: Qualitative scenario framework

		IMAGINED FUTURE OUTCOMES (2050)		
UNCERTAINTY	DESCRIPTION	SCENARIO 1 BUSINESS-AS-USUAL	SCENARIO 2 BIOECONOMY	SCENARIO 3 NEW ENERGY
Concentration of energy & related industry	Scale of energy industries (renewable and fossil fuel)	<p>Low</p> <p>Coal-fired power generation phases out; region does not become a significant energy hub (beyond 1 – 2 projects identified in the 2020s); Continued use of energy transmission.</p>	<p>Medium</p> <p>Energy-oriented development is distributed across a number of regions in Victoria nationally, so as to not to create hotspots of heavy industry.</p> <p>Industrial focus is on the ‘bio-economy’: biomass waste-to-energy; waste-to-nutrients;</p> <p>Geothermal energy utilised to create food and fibre products with high by-product synergy.</p> <p>Sites host industrial scale glasshouse agriculture.</p>	<p>High</p> <p>Region’s energy-oriented development path continues, with both new energy and fossil energy. Industries are located which provide energy and related goods & services to the national economy: coal-to-hydrogen plant; energy storage (utility-scale batteries); major battery recycling facilities for EV and other consumer goods; solar and geothermal energy onsite; associated manufacturing.</p>
Regional transition as socially equitable	Consideration given to equitable provision of energy, food, water, housing	<p>Low</p> <p>Provision is delivered by markets enterprises with relatively light regulation. Consumers are exposed to price increases as costs passed through.</p>	<p>High</p> <p>Institutional context supports a variety of business models</p> <p>Greater diversity in types and scale of delivery of food, housing, energy, water, transport</p>	<p>Low</p> <p>business model innovation is concentrated in energy goods and services</p>
Regional transition founded on sustainable production & consumption	Consideration given to bio-centric circular economy & biodiversity conservation	<p>Low</p> <p>Holistic design is realised in 0-1 exceptional precincts across</p>	<p>High</p> <p>Each site has precincts where multiple uses are supported with</p>	<p>Medium</p> <p>Holistic design in 2-3 industrial precincts</p>

		IMAGINED FUTURE OUTCOMES (2050)		
UNCERTAINTY	DESCRIPTION	SCENARIO 1 BUSINESS-AS-USUAL	SCENARIO 2 BIOECONOMY	SCENARIO 3 NEW ENERGY
	Holistic design & delivery	redeveloped mine land	attention to ecological sustainability and equitable access	

Source: Authors.

Scenario storylines

The study team formulated scenario storylines based on the scenario framework, supplemented by interviews with specialist participants and the outcomes of Workshop 3.

The first scenario we refer to is “**Business-as-Usual**”, which essentially involves meeting the requirements of safe, stable and sustainable and returning to prior land use, where possible. In most cases this was agriculture – typically grazing and some plantation forestry. Biodiversity conservation zones or culturally significant sites are preserved. Power infrastructure may be retained, if considered purposeful. In this scenario, Traditional Owners would be consulted, but there is no expectation of greater involvement. This scenario assumes relinquishment of the sites, upon successful remediation. This would require meeting regulatory expectations and have minimal ongoing maintenance, although monitoring would be essential. Compared to the next two scenarios, it is one that illustrates the possibility that transformative change eludes the best efforts of regional players.

The second scenario – “**Bioeconomy**” – preferences ecological restoration and connectivity, regeneration and Indigenous land use. It also includes circular economy principles applied to food and fibre production, as well as other light industry. This scenario would see initiatives like the Strzelecki Biolink – a biodiversity conservation corridor – enhanced, promote healthy waterways and connectivity and provision of ecosystem services, such as water filtration. Biotourism would be encouraged, through an extensive tracks and trails network, supported by sensitive facilities, lookouts and information booths. There is potential to develop various Indigenous enterprises, such as Traditional Foods, cultural tourism and habitat restoration. Potential exists for a wildlife sanctuary or nature reserve. Integrated agriculture may see vertical farming in hot houses utilising geothermal energy, with waste being converted to fertiliser. Plantings may be used for sustainable timber harvesting or carbon sequestration projects. Sustainable housing options, public transport and community gardens would make this a connected and accessible space.

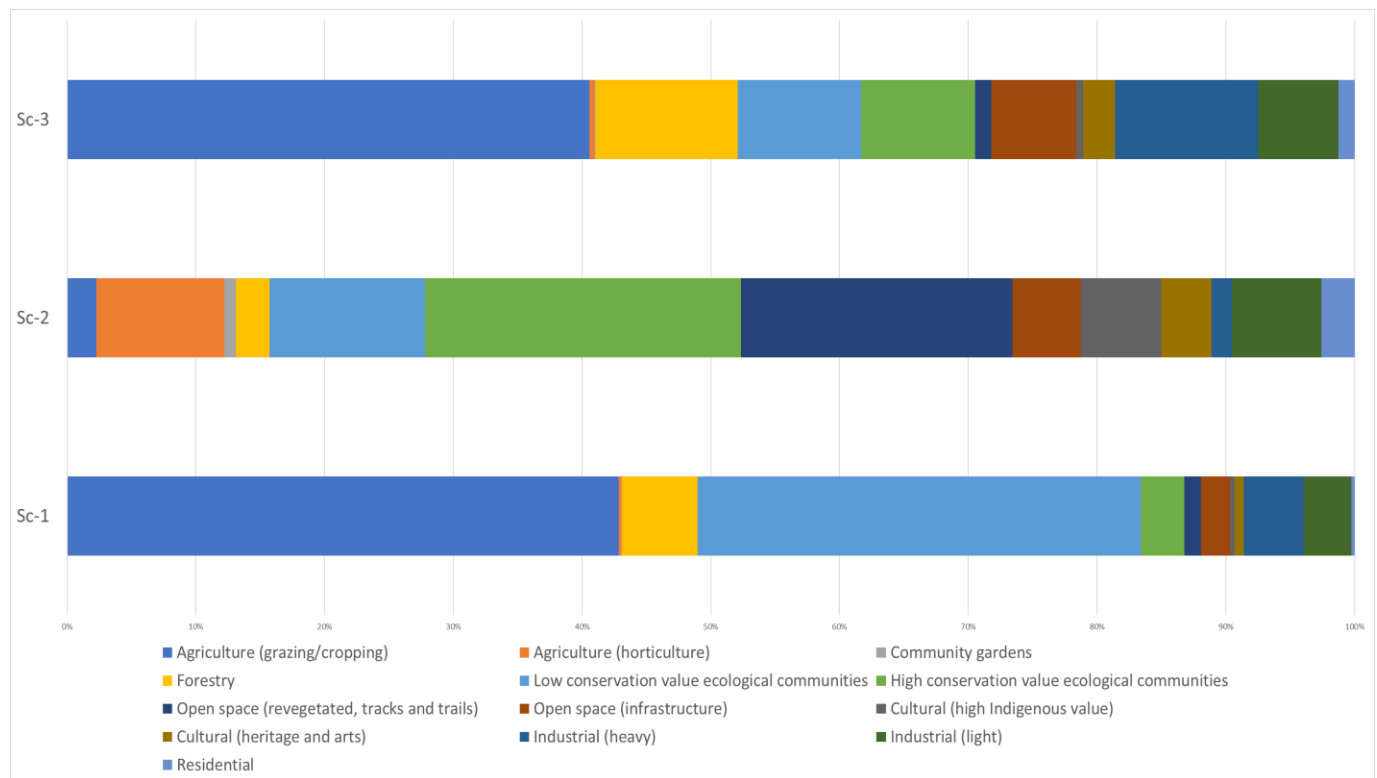
“**New Energy**” – the third scenario – preferences the establishment and utilisation of new energy assets and infrastructure and the associated manufacturing to support this, as well as energy-intensive industrial and commercial uses. New energy options could be fed into existing infrastructure, where possible. The full range of energy technology options (eg solar, wind, geothermal, battery storage, biogas, and potentially pumped hydro, hydrogen from coal with carbon capture and storage, green hydrogen, modular nuclear) are all explored, and those that prove financially viable and attain social license are developed. Energy-related industry is explored and developed vigorously, such as battery recycling, recycling of solar panels and turbines, and associated manufacturing. Energy intensive industries could be co-located at the sites, including data centres, advanced manufacturing, refrigerated storage, recycled water factory and fertiliser production.

Quantified post-mining land use scenarios

The study team formulated three quantified PMLU scenarios, corresponding to ‘BAU’, ‘Bioeconomy’ and ‘New Energy’. We interviewed each mine operator separately, to determine which areas or parcels (surrounding the pit voids and beyond a suitable buffer) could potentially become available for different categories of PMLU. This included discussing factors such as:

- existing infrastructure on site (eg transmission lines)
- biodiversity conservation zones,
- existing or committed land use (eg recreational activities, overburden disposal, ongoing coal mining)
- proximity of roads, rail and towns
- contaminated land.

The team obtained images (and where available, GIS representations) of each site containing the above information, and divided each mine site (excluding areas out of scope) into seven to nine parcels of land (total 23 parcels). To estimate parcel areas, images were digitised in GIS software. At request of the operators, the above spatial information was not shared outside of the research team. For each scenario, a member of the study team familiar with the mine sites distributed the 13 types of PMLU among the 23 parcels, in a manner consistent with the qualitative scenario framework. For example, the storyline of Scenario 2 implies that it has the highest proportion of high conservation value habitat of the three scenarios. Thus, under Scenario 2 each suitable parcel received the highest allocation to this LU. Following this method, each parcel was allocated up to three types of PMLU. The utilisation of each parcel was capped at 100% of its area. Although all of the 13 LU types can be found in each scenario, it was possible that a particular LU type could be absent from a particular former mine site. Application of the above techniques led to three quantified PMLU scenarios as shown in Figure 6.



Source: Authors.

Figure 6: Three scenarios of PMLU

3.6 Evaluation of scenarios

3.6.1 Economic evaluation

The study team developed a decision support tool to estimate the economic value of PMLU scenarios (a component led by University of South Australia). The pilot tool is intended to inform PMLU scenario evaluation at an intermediate level of resolution, not to provide a definitive costing of specific alternatives at the micro level.

Prior to a change of project scope to exclude mine voids, the study team proposed a BCA (benefits-cost analysis). The exclusion⁶ of pit voids meant that costs of rehabilitating the voids were not in scope. The economic analysis was therefore re-framed to focus on the benefits of developing different portfolios of PMLU, for land outside of the pit voids. As the indicator of benefit, the modified method uses market values of different types of land (or willingness-to-pay, in the case of land with conservation value). (The *cost* of developing different categories of land, although not estimated by the tool, is assumed to be incorporated in the market value of that land). The modified tool provides economic insights, albeit with fewer of the nuances and resource requirements that would attend a conventional well-designed BCA.

The decision support tool included the following assumptions:

- Land values generated in a market include all the resource costs of bringing that land to market.
- Market prices of land exchanged in geographically approximate markets to the Latrobe Valley represent the competitive price in the Valley.
- The collective suitability of land can be gained by summing the licensees' assessed potential suitability.
- The timing at which different types of land can be released to market can be adjusted but feasible ranges lie between 1 – 50 years.
- A discount rate applies to market values realized in the future, and this can range between 0% and 100% (default 6%).
- Impact on land values of exogenous infrastructure development (eg improved fast transport access to Melbourne) can be explored by bringing forward the date at which different categories of LU are assumed to be redeveloped.

Property transaction data were collected from CoreLogic and from commercial and residential property agencies. The samples covered the 2022 and 2023 calendar years and were restricted to regional Victorian property markets. The decision support tool was built using software and is available at:

<https://latrobe.replit.app/>. Further details on the economic tool and its functionality (as of Stage One) are available in a short report (Cruse et al., 2023).

⁶ The decision by participants to focus on land outside of pit voids is described in Section 4.3.2.

3.6.2 Multicriteria analysis

The team implemented a participatory multicriteria (MCA) analysis of the PMLU scenarios, drawing on a participatory MCA methodology described by Straton et al. (2011). Key components of that methodology include:

Defining a set of evaluation criteria. An evaluation criterion (EC) is an indicator or metric which can be used to assess the extent to which a particular human value is associated with a particular option under consideration. In our case the 'options' under consideration consisted of three PMLU scenarios.

Table 6 shows the set of evaluation criteria (EC) used in our participatory MCA (Workshop 4). These EC were developed by the study team based on discussions during Workshop 3, supplemented by the literature review (Section 3.3). Each criterion seeks to measure one or more valued outcomes. For example, the area allocated to community gardens (EC no. 3) in a given scenario is an indicator of non-market based food security, and improved health and well-being. Similarly, the area allocated to low conservation value ecological communities in a given scenario (criterion 10), is an indicator of the extent of landscape restoration (a valued outcome) achieved in that scenario.

Table 6: Evaluation criteria

NO.	TYPE OF CRITERION	PREDOMINANT ACTIVITIES OR OUTPUTS	ASSOCIATED VALUED OUTCOMES	EVALUATION CRITERION (EC)
1	Agricultural land (grazing/cropping)	Commercial agriculture (extensive)	Food security (market based)	Area (ha)
2	Agriculture land (horticulture)	Commercial agriculture intensive agriculture, food manufacturing	Food security (market based)	Area (ha)
3	Community garden land	Community-based agriculture	Food security (non-market based); improved health & wellbeing	Area (ha)
4	Cultural land (heritage and arts)	Expression of historical socio-cultural identity (eg museums, visitors centre, arts precinct)	Improved health & wellbeing; Visitor economy	Area (ha)
5	Cultural land (high Indigenous value)	Caring for Country Traditional Foods enterprises	Improved health & wellbeing; self-determination; economic prosperity	Area (ha)
6	Forestry land	Softwood plantation	Fibre production	Area (ha)
7	High conservation value ecological communities land	Ecological restoration, high biodiversity value	Biodiversity conservation	Area (ha)
8	Industrial land (heavy)	Heavy industry economic activity (includes power generation, storage, transmission, battery recycling)	Economic intensification	Area (ha)
9	Industrial land (light)	Innovative industry (sci., technical, business model), supported by business incubators; R&D facilities	Industrial innovation	Area (ha)
10	Low conservation value ecological communities land	Ecological restoration, low biodiversity value	Landscape restoration	Area (ha)
11	Open space land (infrastructure)	Recreation - non-nature based (eg motor sports)	Visitor economy	Area (ha)

NO.	TYPE OF CRITERION	PREDOMINANT ACTIVITIES OR OUTPUTS	ASSOCIATED VALUED OUTCOMES	EVALUATION CRITERION (EC)
12	Open space land (revegetated, tracks and trails)	Recreation - nature-based	Improved health & wellbeing	Area (ha)
13	Residential land	Housing	Basic human security (shelter)	Area (ha)
14	(cross-cutting)	Employment in associated industries	Financial security	Total employment (rank)
15	(Industrial: cross-cutting)	Economic diversity	Economic diversification	No. of different industries (estimate) (rank)
16	(Residential: cross-cutting)	Diversity of housing types (eg social and affordable; medium density; lifestyle)	Diverse housing options	Types of residential land (count) (rank)
17	(cross-cutting)	Ability to pursue diverse activities in proximity	Improved liveability; economic diversification	Diversity of PMLUs (Count of LU activity absent at each site)
18	(cross-cutting)	Land value	Economic prosperity	Economic value (rank or total NPV)
19	(cross-cutting)	Pollutants derived from (heavy) industry	Improved health & wellbeing	Pollutant load (rank)

Source: Authors.

The criteria fall into two sets. In Set 1 (no. 1 – 13 in Table 6) each criterion corresponds to area allocated to each of 13 types of post-mining land use. Set 2 (no. 14 – 19) consists of criteria which seek to capture valued outcomes which cannot be accurately assessed by the spatial extent of a particular land use activity. For example, criteria 15 (economic diversification), 16 (diversity of housing options), and 17 (improved liveability through diversity of activities distributed across the 3 former mine sites) are based on ranking the relative performance of the three scenarios. Such comparative assessment requires consideration of the scenario framework and storylines (Section 3.3.2).

Performance evaluation of each scenario. The study team conducted a rapid evaluation of how each scenario performed against each of the 19 EC. The following techniques were used:

- For EC no. 1 – 13, the evaluation result consists of the total area allocated to each of the 13 LU types in each scenario (see Table 6 above).
- For EC no. 14 – 16 and 18 – 19, the evaluation result consisted of a rank from 1 to 3 assigned to each scenario (in order of highest to lowest performance). Ranks assigned to these EC were based on

inferences by the study team about how the scenario framework and each storyline would impact on a given valued outcome and its associated EC.⁷

- For evaluation criterion no. 17, we counted, for a given scenario, the total number of instances any of the 13 land use types is absent from the 23 parcels that comprise the three sites. The lower the tally of LU types absent from a site, the higher the evaluation result.

Each evaluation result was converted to a normalised evaluation score s using the following formula:

$$s_{ij} = \left(1 - \frac{f_i^+ - f_{ij}}{f_i^+ - f_i^-} \right)$$

(Straton et al., 2011)

Where s_{ij} is the evaluation score of scenario j against criterion i ; f_{ij} is the (initial) evaluation result of scenario j against criterion i , f_i^+ is the ‘ideal’ or ‘best’ result assigned to criterion i , and f_i^- is the ‘anti-ideal’ or ‘worse’ result assigned to criterion i .

‘Ideal’ and ‘anti-ideal’ refer to valued outcomes associated with a given EC. These benchmarks could be defined according to external standards (eg regulatory standards). For this application, the study team defined ‘ideal’ and ‘anti-ideal’ respectively as the maximum and minimum evaluation result observed across the set of 3 scenarios, for a given EC.

Subjective weighting. The final ‘utility score’ of each scenario requires assigning a subjective weight to each of the EC: $u_j = \left[\sum_{i=1}^m w_i s_{ij} \right]$

where u_j is the utility score of scenario j , w_i is the weight assigned to criterion i , and s_{ij} as defined above is the evaluation score of scenario j against criterion i .

Because utility scores are sensitive to subjective weights assigned to EC, the study team implemented a method of individual subjective weighting, following Straton et al. (2011).

During Workshop 3, we asked participants to distribute 100 points across the set of EC in a manner that reflected their individual values. This activity was conducted prior to participants receiving any details of the quantified PMLU scenarios, or the performance evaluation of each scenario.

Participants were provided with 100 points to be distributed across the first set of EC (Table 6, no. 1 – 13), and a separate 100 points to be distributed to the second set of EC (Table 6 **Error! Reference source not found.**, no. 14 – 19).

Discussion of PMLU scenarios

⁷ For criterion 18 (land value), a rank assigned to each scenario during the rapid evaluation was used in Workshop 4, because the economic valuation tool was still in development.

During Workshop 3, after the weighting activity, the rapid evaluation technique and its results were shown to participants. The study team also applied the *weights* provided by each participant for each EC, to the *evaluation scores* for each EC for each scenario, resulting in a distribution of *utility scores*, for each participant (n=25) for each scenario. These distributions of utility scores were visualised to compare the relative performance of the three scenarios (Figure 7 below). These results were used to facilitate a broader discussion of relative PMLU scenario performance, implications for Stage Two of the project, and preferred PMLU futures. Discussion also touched on sensitivity of utility scores, and the utility and limitations of the MCA methodology.

3.7 Ethics

The Project received Ethics approval from the Federation University Human Research Ethics Committee (2023/045).

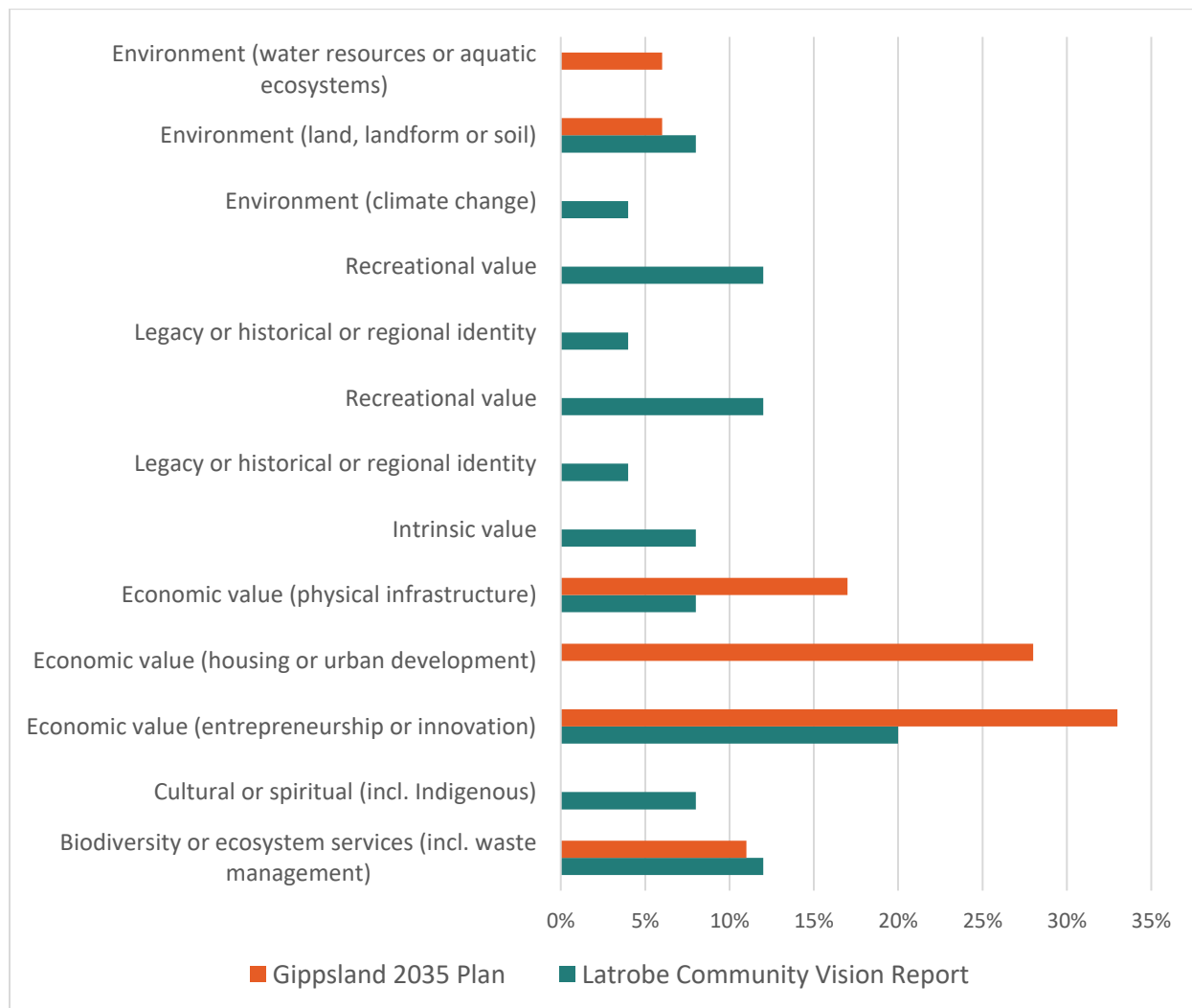
4.0 Results

4.1 Social values in regional visions

This section analyses social or community values, as presented in relevant sections of two recent regional visions: *Gippsland 2035* (LVA, 2023) and *Latrobe Community Vision* (Capire, 2021).

4.1.1 Place-related values

Economic values of place received predominant mention in the two documents (Figure 7). References to economic value of place (in terms of entrepreneurship or economic innovation) comprised more than a quarter of all references to place-based values in *Latrobe Community Vision*. In *Gippsland 2035*, economic value of place – in terms of housing or urban development – comprised 28% of all references to place-based values, but was not evident in *Latrobe Community Vision*.



Source: Authors. Note: percentages refer to fraction of all references classified as a place-related value in each document, based on manual content analysis.

Figure 7: Place-related values

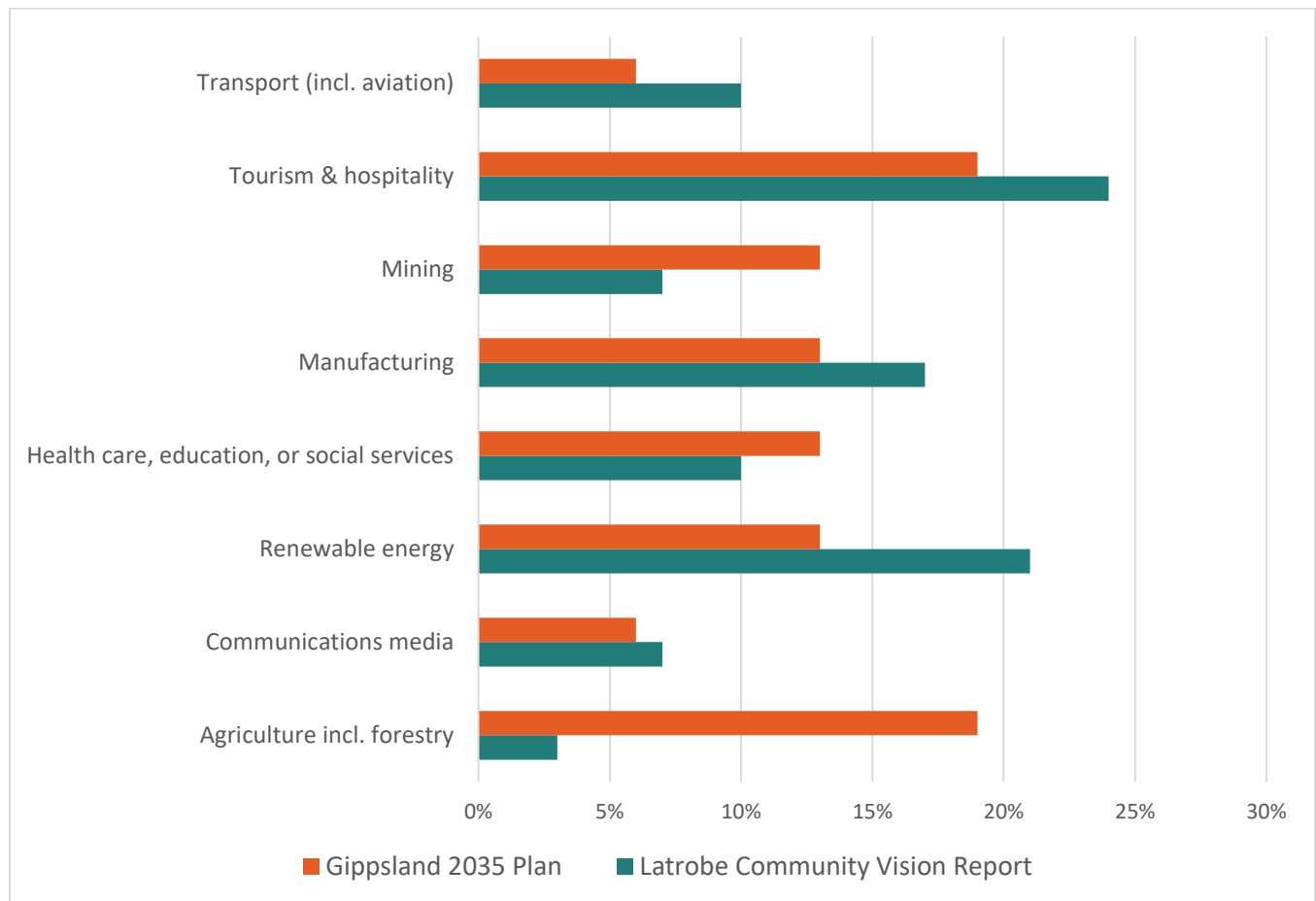
The two documents further diverge in the relative frequency of their references to the following place-related values: water resources; climate change impacts on environment; recreational value of place; legacy, historical, or regional identity; intrinsic value of place; and cultural, spiritual, or Indigenous values of place (Figure 7).

The two documents however converge in the relative frequency of their references to biodiversity and ecosystem services.

4.1.2 Industrial sectors

Tourism and hospitality, renewable energy, and manufacturing were the three dominant industry sectors in both *Gippsland 2035* and *Latrobe Community Vision* (Figure 8). The amount of attention given to the health care-education-social services, and mining sectors are also comparable. Transport and communications media industries received lesser attention in both documents.

Agriculture received significant attention in *Gippsland 2035*, but comparatively modest mention in *Latrobe Community Vision*. This difference may result from the broader geographic scope of *Gippsland 2035* (Gippsland-wide), compared to the Valley-focussed scope of *Latrobe Community Vision*.



Source: Authors. Note: percentages refer to fraction of all references classified as an industrial sector in each document, based on manual content analysis.

Figure 8: Industrial sectors

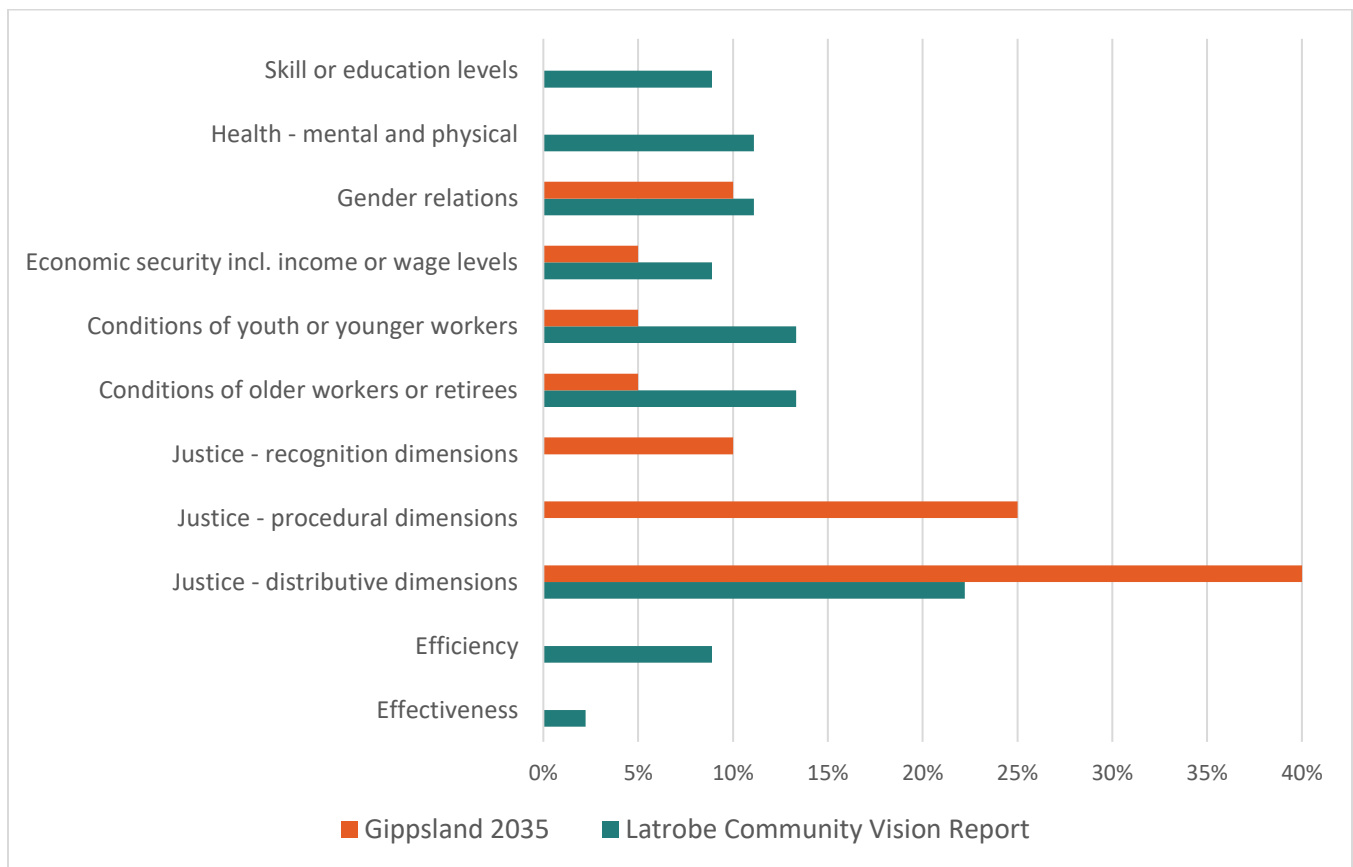
4.1.3 Non-place-related values

There is a major difference in the ways the two documents gave attention to the non-place-related values (Figure 9 **Error! Reference source not found.**). To begin with, not all these values were referred in both documents. Values r

related to skill or education level; health (mental and physical); efficiency; and effectiveness were not evident in *Gippsland 2035*. By contrast recognition and procedural dimensions of justice were not evident in *Latrobe Community Vision*.

However, distributive justice is the predominant non-place-related value in both vision documents, with nearly half (40%) and over one fifth (22%) of all references to this value respectively in *Gippsland 2035* and *Latrobe Community Vision*. Procedural justice, although only evident in *Gippsland 2035*, received one fourth of all references to this non-place-related value. Since justice whether recognition, procedural or distributive dimensions concern social equality and equity, emphasis on this non place-related value manifest similar preoccupations in the visions.

Conditions of youth or younger workers and older workers or retirees as non place-related values received much more attention in *Latrobe Community Vision* than *Gippsland 2035*. That is also the case somewhat with economic security (including income and wage levels). Gender relations, on the other hand, has almost similar level of references in the two vision documents.

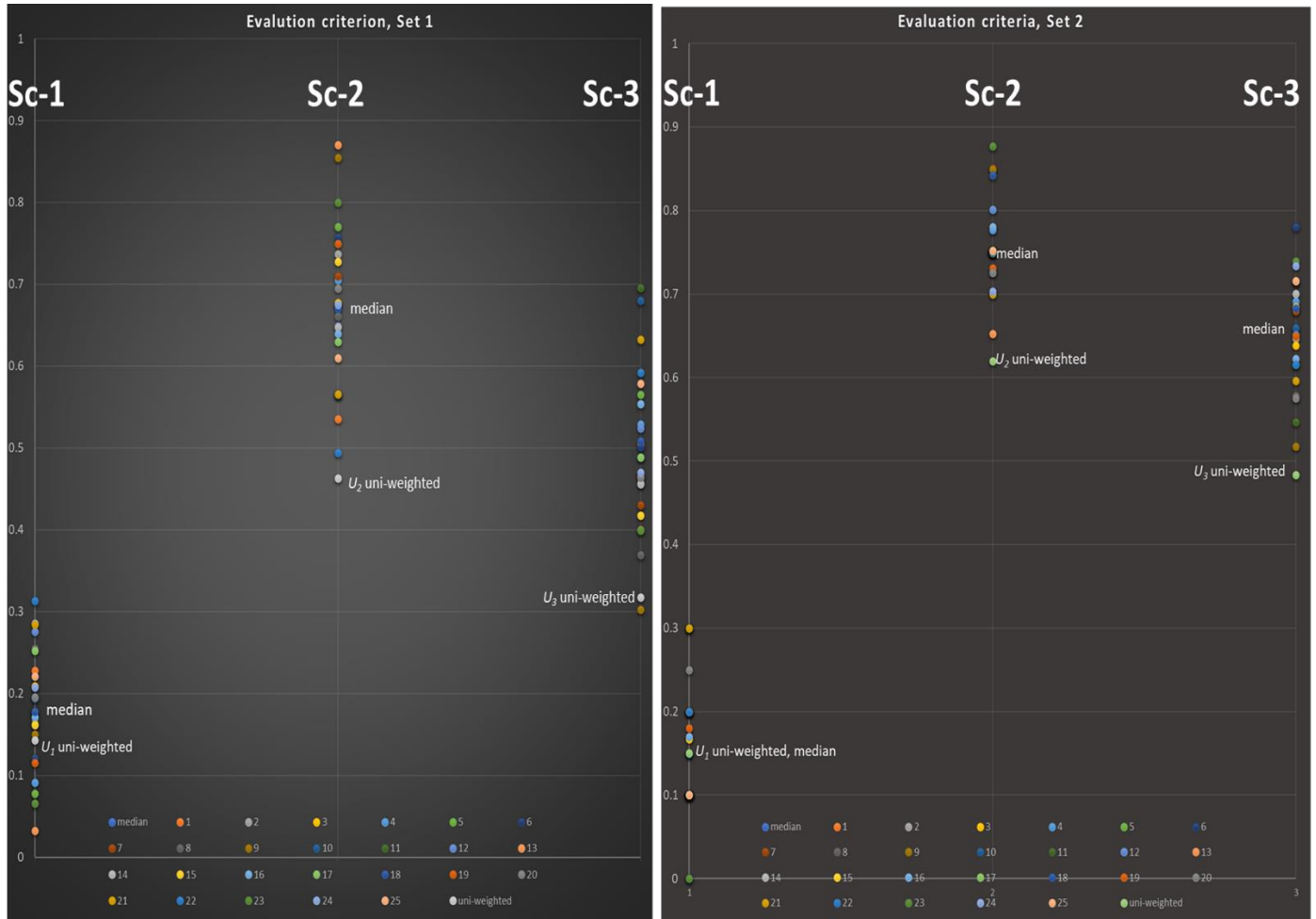


Source: Authors. Note: percentages refer to fraction of all references classified as a non-place-related value in each document, based on manual content analysis.

Figure 9: Non-place-related values

4.2 Performance of PMLU scenarios

Figure 10 shows distributions of utility scores. As noted in Section 3.6, these scores are based on rapid evaluations of each scenario against two sets of evaluation criteria (totalling 18 criteria), with each criterion weighted by each participant.



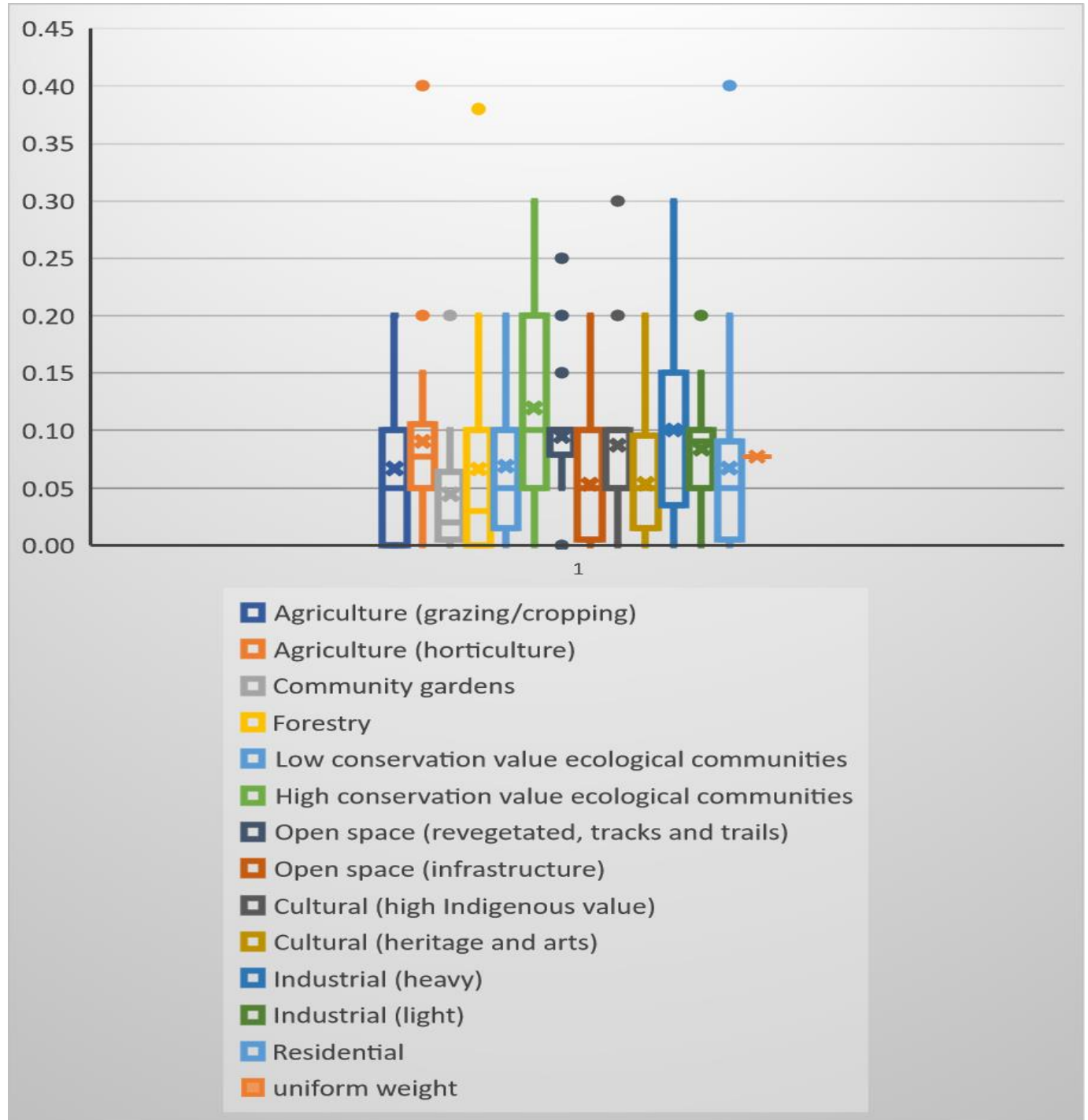
Source: Authors. Notes: ‘Set 1’ refers to EC no. 1–13; ‘Set 2’, EC no. 14–19 (Table 6). ‘Sc-1’, ‘Sc-2’, and ‘Sc-3’ correspond to BAU, Bioeconomy, and New Energy scenarios. ‘ U_j uni-weighted’ refers to utility score for scenario j with uniform weighting. Median refers to median of individually weighted utility scores.

Figure 10: Distribution of utility scores for three scenarios

The median of individually weighted utility scores is shown in Figure 10. The figure also shows scenario performance in a case where weights are distributed uniformly among the two sets of EC (equivalent to an ‘unweighted’ utility score). It can be seen that on a uniform weighted basis, Scenario 2 (Bioeconomy) has the highest performance, followed by Scenario 3 (New Energy) and Scenario 1 (BAU).

However, when participant weights are considered, we see that the median utility scores are higher than the ‘unweighted’ score for all three scenarios, and notably so for Scenarios 2 and 3. For Scenario 2 and Scenario 3 respectively, 25 out of 25, and 24 out of 25, of individual utility scores exceeded the ‘unweighted’ utility score.

This means that participants, rather than weighting the EC uniformly, tended to assign higher-than-uniform weight to criteria against which Scenarios 2 and 3 performed well compared to Scenario 1. This can be seen in Figure 11 below, which shows the distribution of weights participants assigned to the 13 EC in Set 1.



Source: Authors. Notes: Box and whisker plot: 'x' denotes mean; horizontal line in each shape denotes median. Right-most orange horizontal line with 'x' denotes a uniform weight of 1/13 (0.08).

Figure 11: Distribution of individual weights, evaluation criteria Set 1

As shown in Figure 11, compared to a uniform weight of 0.08, participants assigned higher than uniform weight to the following land uses:

- high conservation value ecological communities
- open space (revegetated, with tracks and trails)
- cultural uses with high Indigenous value
- both heavy and light industrial uses.

Scenario 2 (Bioeconomy) provides the above LU types to a greater extent than Scenario 1 or Scenario 3 (see Figure 6). Similarly, the higher performance of Scenario 3 (New Energy) relative to Scenario 1 occurs because the former provides significantly more industrial land, and more high conservation value ecological land, than the latter. The relative performance of scenarios can be traced back to what participants value, and the ability of scenarios to provide types of land use which realise those values.

4.3 Changes to collaborative dynamics during Stage One (2022–2023)

4.3.1 Initial drivers of collaboration in project

The integrative framework of collaborative governance recognises four types of initial driver of collaboration. As noted in Section 3.1, those are the recognition of uncertainty; interdependence; consequential incentives, and initiating leadership.

Initiating leadership to develop a future vision for redeveloped mine land and its contribution to the Latrobe Valley was a common gap identified in preliminary interviews undertaken while framing this research in late 2022.

An important and ongoing element of the system context, which predated the project, relates to *uncertainty* around feasibility of proposed mine rehabilitation concepts, as they are yet to advance through the approvals process. Prior to the project, this uncertainty had contributed to a deferral and reduction of activities related to envisioning future land uses.

During Stage One of our project, the state government released an Amendment to the LVRRS (DEECA, 2023) which some mine licensees regard as providing greater policy certainty (pers. commun to T. Foran, April 2024). The LVRRS Amendment allows mine licensees to apply for access to water for mine rehabilitation and sets out the type of conditions that could be applied to any access to water for mine rehabilitation to not 'diminish the entitlements of existing water users and values in Gippsland' (2023: 16). The Amendment further signals that:

there is merit in mine licensees making an application to the Minister for Water for access to water for mine rehabilitation (if needed) earlier than 5 years prior to ceasing mining operations at the site. This will mean assessments and decisions can better take into account the cumulative regional impacts of access to water across all 3 Latrobe Valley mines. An earlier decision on access to water provides greater confidence in rehabilitation planning.

DEECA, 2023: 19

Each of the three mines are required to submit their Declared Mine Rehabilitation Plans by October 2025. However, as of this writing, ENGIE is currently undergoing the EES process and AGL have recently made an application for water access, triggering a range of regulatory and legislative processes. In light of the above

context, the project has provided a forum to re-frame the discussion beyond final landforms to explore future land uses for the significant parcels of land surrounding the mine voids.

Multiple facets of *interdependence* exist, beginning with the fact that site-specific knowledge is not widely available is a specific form of interdependence. Furthermore, although each of the operators is responsible for rehabilitation of their own site, realisation of future opportunities will require skills in land redevelopment. And as recognised in state and federal government requirements for Hazelwood’s rehabilitation plan to undergo EES and EPBC review, *interdependence* exists between resources required to rehabilitate individual sites, site-specific PMLU outcomes, and regional-scale outcomes. The core stakeholders are aware of such interdependence.

Regarding *consequential incentives*, the safety and stability of land form rehabilitation outcomes remains to be established (rehabilitation plans have not been approved as of this writing). Given non-negligible levels of policy and geotechnical risk, the possibility that mine voids could remain inaccessible to the public indefinitely – a worst-case scenario – cannot be ruled out. We observed that the core participants regarded generating a PMLU vision for land outside of the pit voids, as a means to avoid or mitigate such a scenario for the mine voids. As one participant noted, an empty pit would ‘sterilise’ surrounding land use (T. Foran, meeting notes, 21/3/2023).

Positive incentives are also apparent. A previous study of values held among diverse rightsholders and stakeholders in the Latrobe Valley (and two other regions) navigating post-mining transition found that the best possible post-mining outcome expressed by research participants was: ‘the definition and realisation of significant, net-positive regional development outcomes’, where ‘net-positive outcome’ refers to outcomes in which multiple values are realised in a just manner (Foran et al., 2022). Although perspectives differ on the mix of those values, individuals in the prior study, who also participated in this project, expressed visions that departed significantly from BAU (ibid: section 4).

4.3.2 Collaborative dynamics

Principled engagement

During Stage One, the ‘core’ stakeholders (ie, the sub-set of participants with formal responsibilities for mine closure and post-mining regional development; Section 3.2) engaged in a series of discussions which led to agreement among these participants on the project scope (described below), as well as a set of ‘project principles’, and ‘LU planning principles’ (Annex 3).

These activities and outputs are evidence of the principled engagement (‘PE’) component of collaborative dynamics. As introduced in Section 3.1 and summarised in Table 7, capability for principled engagement involves interacting activities of discovery, definition, deliberation, and making determinations. Table 7 identifies activities which contributed most to the above dimensions of PE.

Table 7: Contribution of participatory activities to ‘principled engagement’

ELEMENT	DEFINITION	RELEVANT PROJECT ACTIVITIES
Discovery	Identification & analysis of relevant information	Inception interviews – participants discussed interests & concerns/values with research team

Definition	Effort to build shared meaning around issues relevant to LCP	Steering Committee 1 – ‘project principles’ discussed Workshop 1 – scope of project debated and defined Workshop 2 – LU planning principles; discussion of economic valuation tool
Deliberation	Use of candid & reasoned discussion to address issues	Workshop 1 (scope of project) Workshop 3 (values and EC) Workshop 4 (MCA)
Determinations	Decisions reached by project participants	Workshop 1 – project principles discussed and agreed Workshop 4 (MCA)

Source: Authors.

The ability of participants to agree on the project’s spatial and topical scope is a notable example of principled engagement which emerged in Stage One. The project’s scope (as described in the proposal approved by CRC TiME and partners for funding in late 2022) envisaged that the project would identify PMLU ‘options’ encompassing the entirety of the land licensed to the three mine operators. The options would not be developed on a customised basis for each individual site, but they were to be ‘achievable’ and ‘feasible’. The proposed scope involved formulating alternative options for rehabilitated mine voids, including water-filled, and (as a stylized option for benefit-cost-analysis), maintaining the *status quo*. The above scope and methods were the focus of discussion during Workshop 1 (May 2023).

Participants from the mining domain who participated in this workshop (and served on the project steering committee) were familiar with each other through interaction in activities prior to the project (eg the Latrobe Valley Mine Rehabilitation Advisory Committee). During Workshop 1, a subset of these participants were willing to initiate vigorous discussion with the study team around the project’s topical and geographic scope and other matters they considered of concern. Discussions catalysed by a subset of participants opened a space for dialogue, in which other participants with less strong ties to the mining domain could share their concerns regarding the project’s aim, methods and scope. After Workshop 1, two operators and one government agency requested that the project not engage with the question of alternative final *landforms*, and focus instead on alternative post-mining *land use* scenarios (ie assuming that each mine void would be rehabilitated to a pit lake).

This recommendation was based on several considerations, including the presence of other, formal knowledge generating and decision-making processes which were understood as the primary venues to address the above high-profile topic. (These processes include a requirement to submit Declared Mine Rehabilitation Plans for approval by 2025, as well as the EES process underway for the Hazelwood mine. Studies conducted for the EES are expected to generate knowledge of impact of a water-filled mine void on regional ecological values.)

Some researchers initially resisted the requested narrowing of project scope. These researchers were concerned that it would deter participation later in the project, with some prospective stakeholders and rightsholders perceiving the scope as arbitrary and/or inadequate to address the full set of their interests and concerns (Section 5.2).

With respect to the revised project scope, participants recognised that assumptions about mine void rehabilitation would influence land use outcomes. Nonetheless, they agreed that the topic of preferred post-mining land uses, for land surrounding the mine voids, deserved to be addressed by a research project. The definition of a revised scope and its implications for study methodology were discussed prior to and during the July 2023 steering committee meeting, and the committee agreed that:

The physical scope of the project is to consider future feasible land uses for the current mine licences beyond the voids and appropriate buffer zones, within the regional context and assuming safe, stable and sustainable landforms have been achieved.⁸

During Workshops 3 and 4, the participatory design broadened to include new participants. In survey responses, (see Figure 12 in Annex 4) participants indicated that they felt respected and heard. However some expressed concern about the project scope, which had been determined by others, and the constrained time for deliberation:

The scope of the project feels narrow which is my only concern regarding the project achieving a successful outcome that will resonate with the broader community. (Post-Workshop 3 survey response)

There was not sufficient time [for participants to communicate reasons to support their statements], hence my 'Neither agree nor disagree' response. (Post-Workshop 4 survey response)

Shared motivation

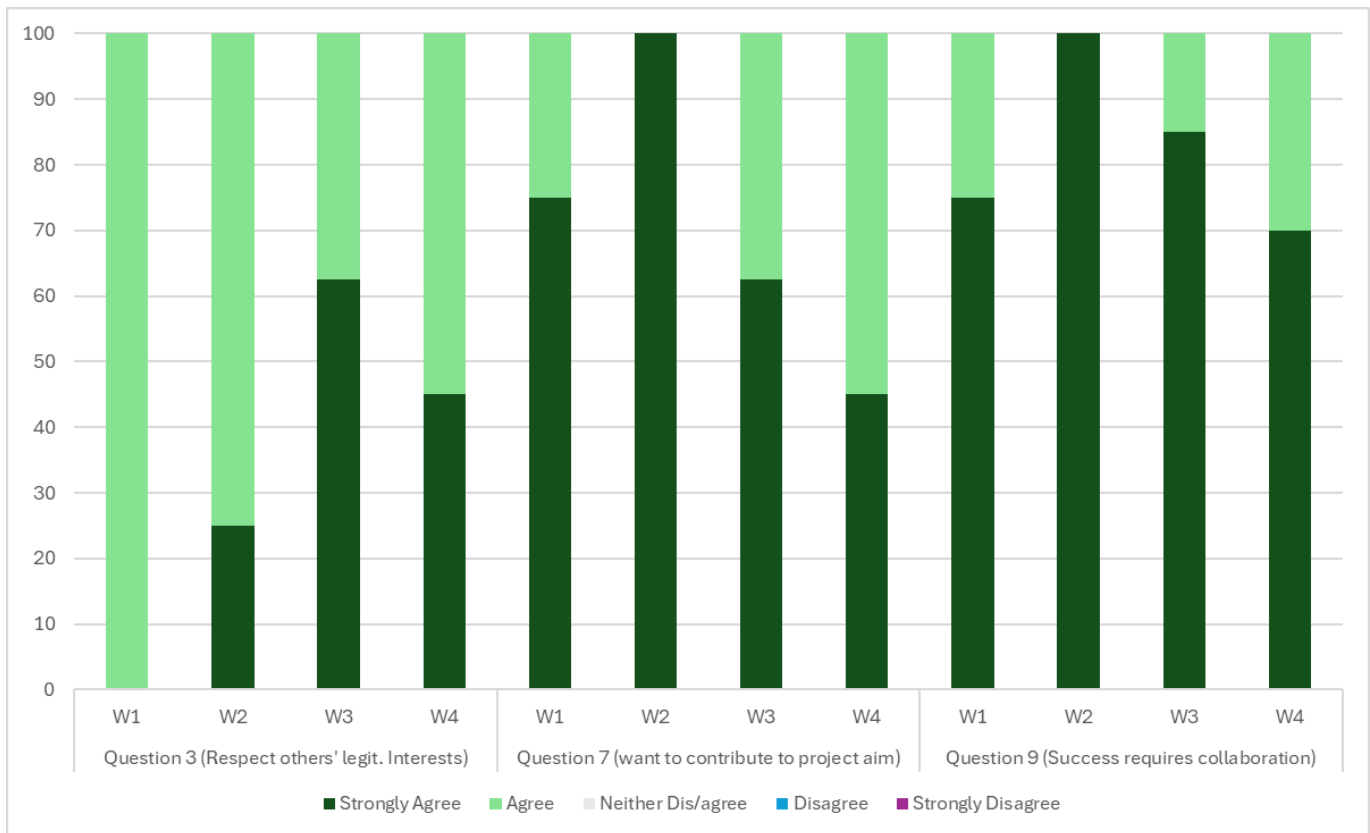
As introduced above, 'shared motivation' refers to interpersonal interactions that build trust, mutual understanding, create a sense of internal legitimacy, and motivate commitment.

This dimension of collaborative dynamics was evaluated using Questions 3, 4, and 9 of the participant survey (Annex 4). Although response rates from Workshop 1 (May 2023) and Workshop 2 (August 2023) were low (4/11 and 4/9, respectively), the feedback was positive (Figure 11).

Workshops 3 and 4 included a broader group of participants, many of whom who had little engagement with the project prior to the workshops. Nonetheless, participants agreed or strongly agreed that they respected others' interests; desired to contribute to project aim of defining a shared vision; and understood that collaboration was key to success.

Figure 12 shows that the trajectory from Workshop 1 to Workshop 4 of selected indicators of shared motivation among a growing participant pool. Survey responses were provided anonymously to protect privacy, so that it is not possible to track changes in individual responses over time. Nonetheless, in Workshop 1, 4 participants 'agreed' that they respect others' legitimate interests (Question 3; a metric of mutual understanding). By Workshop 4, 11 participants 'agreed' or 'strongly agreed' with this statement.

⁸ Record of Steering Committee meeting, 27 July 2023.



Source: Authors. Notes: Columns show %. Full wording of survey questions shown in Annex 4. Response rate: Workshop 1 (n=4/11); Workshop 2 (n=4/9); Workshop 3 (n=8/21); Workshop 4 (n=11/24).

Figure 12: Survey responses to questions related to shared motivation

Capacity for joint action

Drawing on collaborative governance literature (Emerson & Nabatchi, 2015a), the process performance of the project can be evaluated through the effective demonstration of capacity for joint action with the LCP project participants (refer to Table 3).

This component of collaborative governance consists of four sub-components. The establishment and engagement of the steering committee gave strong direction of the LCP and ‘buy-in’ from the key actors. This included the co-design of *procedural arrangements*, such as the project principles, which guided our rules of engagement, and the PMLU intentions, co-designed in Workshop 1.

One of the key benefits of the LCP has been the *knowledge* exchange between participants both within the steering committee and in workshops. This has led to a greater understanding between participants of both limitations and opportunities for PMLU. In some cases, where information was not available in the public domain, knowledge was made available to the researchers to include in the synthesis – such as suitability of certain land parcels on each of the mine sites for proposed future land uses. In addition, specific subject area expertise has been provided by actors outside of the core participant group to provide independent advice and support for the project. Importantly, Stage One has brought together relevant knowledge to inform community deliberations in Stage Two, with the permission of the operators.

Key to the success of LCP is the availability of *resources*, including funding, expertise and support for the project. The evaluation survey from workshops 3 and 4 found that the majority of participants strongly agreed that collaboration between public and private actors was critical for success, and most (except 2 who were neutral) agreed or strongly agreed that the project team had the functional ‘assets’ needed for successful delivery. A positive endorsement for the project was the increase in both financial and in-kind partners for Stage Two of the LCP, as well as continued support from all Stage One participants.

The absence of clear *leadership* in developing a future vision for the Latrobe Valley, post mining, identified in section 4.3.1 has been both a challenge for the LCP and an incentive to its inception. During Stage One, participants identified this process as providing *leadership* in developing a shared vision. For example, following a presentation to the Latrobe Valley Mine Rehabilitation Advisory Committee (LVMRAC) in November 2023, local and state government representatives affirmed the LCP as a driver for developing a future vision for the Latrobe Valley post-mining (government participants, pers. comm., November, 2023).

5.0 Discussion

5.1 Preferred PMLU scenarios

Latrobe Collaborative Planning aims to elicit a shared PMLU vision for the Valley’s mine lands. Stage One of the project approached this aim by constructing exploratory qualitative scenarios. We invited participants to explore how three spatially explicit LU portfolios – which were indicative, quantitative expressions of the exploratory scenarios – performed against a set of evaluation criteria which participants previously contributed to defining.

The methodology used in Stage One involved a combination of scenario thinking and multicriteria analysis techniques. This section reflects on the usefulness and limitations of the techniques as implemented.

Use of exploratory scenarios

The study team based the three PMLU scenarios on a qualitative framework which had a high degree of contrast in imagined future outcomes for each of its critical uncertainties (Table 5). A criticism of this approach is that it is more realistic to expect that any future land use vision for the three sites would include elements of all three scenarios. However, developers of future sites might emphasise a narrower range of LU, focussed on the dominant assets at particular sites, rather than seek to develop highly diverse portfolios of LU.

The utility of this technique stems not from its ability to describe the *most likely* or most realistic future, rather its ability to visualise futures which depart from ‘business-as-usual.’ The technique’s value stems from its ability to illustrate alternative futures in which the region has been transformed. This is relevant in a region such as the Latrobe Valley which, despite having transition on its agenda several times this century, does not appear to have utilised scenarios which explicitly imagine transformative changes and compare them to business-as-usual.

With respect to alternative futures, we found that participants preferred Scenario 2 (Bioeconomy) and Scenario 3 (New Energy) over Scenario 1 (BAU). Essentially, this is because Scenarios 2 and 3 provide more of the types of land use which align with their values (Section 4.1). During Workshop 4, participants noted that unless the community could come together to help realise either of these scenarios, the region would be left with lower valued outcomes, represented by BAU. This was seen by participants as a call to action. Thus, some elements of these exploratory futures might not be likely in today’s context, yet still appeal to participants, contributing significant qualitative attributes to the PMLU vision.

Analytic rigour

Plausibility of quantitative PMLU scenarios. The PMLU scenarios specify amounts of land developed for various categories of LU in 2050. However, the study team did not constrain these future portfolios of land by using demand and supply dynamics for specific types of land. One challenge is that the interval 2024 to 2050 places limits on extrapolation. Consequently, the PMLU scenarios may not be plausible.

Limitations of the rapid evaluation technique used in MCA. In some cases, the scenario framework and storylines are sufficiently informative that the performance of each scenario could be ranked for the purpose of quantitative evaluation (including assigning ranks). In other cases, the storylines are ambiguous. For example, we assumed that total employment under Scenario 3 (New Energy) is greater than Scenario 2 (Bioeconomy), on the basis that the scale of industrial activity in the former is greater, and assuming that scale correlates with demand for labour. This may not be the case, for example if much of the manual labour is undertaken by automation.

Responses to the above limitations could consist of: (i) defining quantitative PMLU scenarios for a future date for which relevant information is available (eg projections of LU demand and supply, industrial structure); or (ii) economic modelling using assumptions directly linked to the systems dynamics underpinning each exploratory future.

Representation of participants' values

The project encountered challenges of abstraction and scale when attempting to work with mine land and social values in a participatory manner. The quantitative PMLU scenarios formulated during Stage One were communicated in a relatively abstract manner to participants, that is, without providing opportunities for participants to visit any of the mine sites, or providing images or other objects to interact with, representing imagined futures. Although maps of the sites were available during the workshops, these were not used in any of the exploratory activities.

With respect to scale (ie spatial extent), some values are not reducible to (absolute) spatial extent allocated to a particular LU. That is to say, some place-related values could conceivably be met in PMLU portfolios which may have relatively lower aggregate *area*, but nonetheless deliver, through elements of landscape design, relatively high value to various types of LU.

To improve visioning during Stage Two, the project could draw on planning techniques which include more experiential interaction with sites, as well as conducting assessment of alternative LU portfolios at a typical precinct scale.

In this regard, it should be noted that the project's three quantitative PMLU scenarios were assembled in a bottom-up way from site-specific data. At the request of operators, site-specific scenarios were not shared with participants during Stage One. However, it is possible that during Stage Two, with a deepening of collaborative dynamics, one or more of the licensees would be willing to allow the implications for regional-scale preferred outcomes to be explored at a precinct- or parcel-scale, using specific sites as case studies. This might be done by visualising parcels or precincts which realise three or more LU values (eg land with high and low conservation values, community gardens, and residential land); or alternatives realisations of the Strzelecki biolink (at a range of scales).

Deepening deliberation

Although participants agreed during the final workshop of Stage One that they wished to avoid ‘BAU’ as the Valley’s future post-mining land use scenario, Stage One provided relatively limited time to deliberate in depth on a shared PMLU vision. For this reason, we did not attempt to explore a consensus distribution of weights across the evaluation criteria.

Similarly, we did not explore the question of what conditions enable futures articulated and preferred by today’s participants to be realised in the long-term. This is an important question. While it is important from the perspective of just transition for current generations of residents to articulate preferred PMLU futures, our participants do not have the capability to *directly* realise any scenario that depicts a future *in 2050*. Many key determinations and LU development decisions will be taken closer to that date. The methodology focussed on eliciting preferences for future states, not deliberating what conditions (ranging from institutional arrangements to business models) which would enable those future states, and how best to take action.

Nonetheless, actions in the near- to medium-term to establish enabling conditions exist, including: exploring how to explicitly link the visioning process of this project to mine rehabilitation plans required of operators; and addressing currently restrictive LU policies such as the State Resource Overlay.

5.2 Collaborative dynamics during Stage One (2022 – 2023)

Challenges of collaboration

The success of Stage One of the LCP was dependent on the willingness of participants to share information and provide informed opinions on the development of the land use scenarios and their suitability for both the available land and the needs of the region. This is a clear demonstration of capacity for joint action. Whilst all of the participants came to the project with positive intentions, there were clear limitations around what information could be shared in such a forum – particularly from the perspective of the private operators and government departments represented. Engaging in interviews and meetings with participants individually assisted in providing the researchers with a more nuanced understanding of these challenges and allowed us to guide the discussions accordingly. However, this was not flawless.

The challenges of principled engagement and shared motivation are evident in respondents’ open-ended comments after Workshop 1:

The first workshop was challenging, if only because it felt like there was a surrogate negotiation was occurring around potential land uses. I believe that everyone entered the room in good faith. We need to keep this mindset along with a willingness to explore the possibilities, for this project to work. (Respondent, survey following Workshop 1)

Similar notions were also expressed in private conversations to the research team.

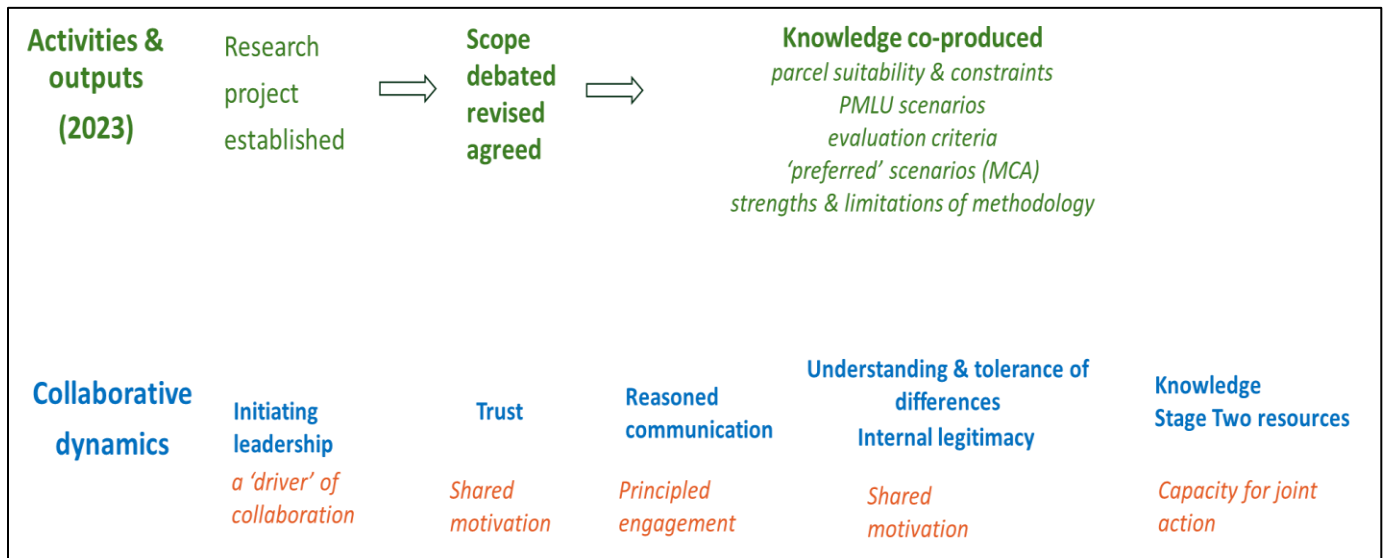
Whilst the respondent here reflects on good intentions, the concern expressed is around potential vested interests, or utilisation of the process for individual, rather than collective benefit. In response to this, effort was made in subsequent workshops to minimise the dominance of any particular participants.

However, there continued to be elements of perception of servicing various participants’ own needs and dominance, rather than those of the collaborative project. Again, this was largely voiced in conversations outside of the workshops and meetings, with one participant responding to the survey:

The dominance and behaviour of some organisations, and the way by which they share their views will make it difficult to achieve consensus on a shared vision and successful project delivery. (Respondent, survey following Workshop 2)

One of the challenges raised was specifically related to the original spatial and topical scope of the project. As noted above (Section 4.3), a change of scope requested by two mine operators and one government agency was debated among the core participants and researchers. Some researchers initially resisted the exclusion of mine voids from the project scope. They were concerned that the amended scope would be perceived as avoiding an important policy issue (namely the *pros* and *cons* of using river system water to rehabilitate mine voids), in the context of State decision making processes with modest space for public participation (Section 2).

However, once the core participants agreed that participatory planning for land outside of the mine voids and associated buffers was nonetheless a valuable objective (see Section 4.3.2, ‘Principled engagement’), the project proceeded to co-produce knowledge. Knowledge co-production was in an iterative and cumulative, included a range of activities and intermediate outputs, as described in Section 3 and summarised in Figure 13 below.



Source: Authors.

Figure 13: Knowledge co-production and collaborative dynamics

The effort involved in defining an acceptable and valuable scope of project – and the activities later required to co-produce knowledge – contributed to deepening collaborative dynamics among the core stakeholders. Deliberation and determinations on project scope required initial levels of trust, which enabled reasoned communication, and understanding and tolerance of legitimate differences (Fig. 13, bottom panel). Similarly, the knowledge produced required shared motivation and principled engagement. Successive interim knowledge outputs (eg planning principles, LU scenarios) fed back to deepen these elements of collaborative dynamics. In turn, the cumulative body of knowledge produced in Stage One has arguably deepened the collaboration’s capacity for joint action in Stage Two.

While collaborative dynamics thus deepened among the core participants during Stage One, Workshops 3 and 4 introduced new participants to the project. Although less familiar with mine rehabilitation as a policy domain, the prevailing response from the ‘new’ participants, both in evaluation surveys and conversations, was appreciation for involvement, increased understanding of the process and support for the project. This has included reference to the LCP project in the communications of the Latrobe Health Assembly, Latrobe Health Advocate, Latrobe Valley Authority and Great Latrobe Park. While some of the broader participant group remain challenged by elements in proposed rehabilitation plans (notably, provision of water to fill mine voids), they expressed trust in the project and the collaborative process the study team is facilitating (correspondence to J.Reeves from workshop participants, October and November, 2023).

Although various challenges have arisen in the collaborative dynamics of the LCP, as outlined above, addressing these challenges has arguably led to a building of trust both with the process and the intent of the project. This is corroborated by the observation that all participants continued, and in some cases increased their resourcing for Stage Two.

Indigenous representation

Both in the design and implementation phases of Stage One, consultation was undertaken with GLaWAC leadership about how best to include First Nation’s voices in the LCP. GLaWAC participated in Workshop 1 and Workshop 4, as well as several individual discussions. However, one area where Stage One of the project did not meet its targets is in inclusion of First Nation’s voices in the form of an ‘Indigenous Community Reference Group’ (ie deliberative platform for Indigenous people). On request of GLaWAC, the establishment of this Group was postponed to Stage Two.

One of the barriers to participation is the extreme work burden on GLaWAC, as the Registered Aboriginal Party of much of Gippsland, at a time when several very significant transitions are happening – such as planning for an offshore wind industry, development of extensive transmission infrastructure and cessation of native timber harvesting, as well as existing projects. Another identified barrier was being clear on what was being asked of First Nations participants in Stage One. It was recommended by GLaWAC that until the scope for deliberation on future land use aspirations was more clearly defined, it would be further confusing and disempowering for community. On the advice of GLaWAC, we have referred to their *Whole of Country Plan* and *Aboriginal Economic Development Strategy* to inform our literature reviews on community values and regional economic development planning, from an Indigenous perspective (Haque, Reeves, & Foran, 2024, n.d.).

GLaWAC has recently established an office in the Latrobe Valley, with several staff developing a position statement on mine rehabilitation. These staff attended Workshop 4 and have held planning workshops with us to determine how best to include Indigenous community participants in Stage Two and refine our AIATSIS Ethics application. We are working closely with GLaWAC to ensure that our two processes are complementary and have sought their advice and support on the composition of the Indigenous Community Reference Group.

6.0 Conclusion

The key outcome sought by the Latrobe Valley Collaborative Planning project is to co-design a positive vision for the Latrobe Valley, beyond coal-fired power generation. Visioning the future land uses of Latrobe Valley’s open-cut coal mines requires rightsholders and stakeholders to express and deliberate existing and future societal values and concerns, including recurring concerns such as increased workforce participation, Indigenous self-

determination, regeneration of environment, and climate adaptation. Beyond that, the mine land once rehabilitated has potential to enhance the region's competitive advantages, which include its food and fibre economy; its visitor economy; its focus on health and wellbeing; new energy; and advanced manufacturing.

Stage One (reported here) sought to develop a robust framework to support deliberation for future land use planning. We established a collaborative governance platform, in which a set of core participants contributed various forms of information and knowledge. This platform provided a basis for the formulation of preliminary post-mining land use scenarios, which align with values held in the community and regional development actors. The participants' ability to produce and interact with such knowledge fed back to deepen trust and the capacity for joint action. This is a notable outcome of Stage One.

Next steps

Stage Two (commencing mid-2024) will further explore land use scenarios and options through a series of three deliberations with focus on residents of the Latrobe Valley: a Latrobe Valley Citizen Jury, an Indigenous Community Reference Panel and a Youth Design Summit. The types of institutional arrangements that may be required to achieve preferred future land use scenarios and options will be explored. This work will help inform future thinking and decision making both at a site-specific level and for the Latrobe Valley, more broadly. It allows the space for regional collaboration and testing of ideas in a creative setting, while acknowledging current constraints. The explicit inclusion of social equity and sustainability in PMLU scenarios and visions facilitates regional responses to societal needs and concerns.

The Stage Two work will continue to explore how collaborative governance and multi-stakeholder deliberation may contribute to catalysing place-based shared outcomes, seeking insights which are applicable to regions in transition.

7.0 Acknowledgments

We would like to acknowledge more than 25 people who participated in the activities of this project, and eight reviewers whose comments helped improve the report. We thank the project's Steering Committee and Advisors (named in Annex A) for multiple contributions to this work, and gratefully acknowledge the many people who have helped inform this work.

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Annex 1 Project Governance

Researchers

The research team brings together expertise in social science, sustainable regional development, place-based knowledge, collaborative governance and regions in transition. The social science team is co-led by Jess Reeves (Fed Uni) and Tira Foran (CSIRO), and the economics team by Lin Crase and Andrew Beer.

Name	Institution	Role
Jess Reeves	Federation University	Project lead, Social
Tira Foran	CSIRO	Project lead, Social
Kazi Haque	Federation University	Research Fellow, Social (ECR)
Lin Crase	University of South Australia	Economic
Andrew Beer	University of South Australia	Economic
Chris Leishman	University of South Australia	Economic (ECR)
Clayton Pilat	University of South Australia	Economic (ECR)

Steering Committee:

The steering committee for Stage One of the project was established in March 2023 and is comprised of core stakeholders with some degree of responsibility for either delivering the final outcomes for the mine sites or economic development in the Latrobe Valley. Members of the steering committee all have an intimate understanding of the Latrobe Valley and both the challenges and opportunities the region faces.

Organisation	Representation
AGL	Benn Snell
DEECA	Matt Armstrong, Nick Burke, Chris McAuley
Energy Australia	Rhonda Hastie, Georgina Snelling
Engie	Adam Moran
GLaWAC	Daniel Miller, Katherine Mullet
Latrobe City Council	Bruce Connelly
Loy Yang B	Daniel Mainville
LVA	Chris Buckingham
MLRA	Jen Brereton

Table 8: Steering committee meeting schedule

No.	Time/Date	Agenda
1	21 March 2023	Accept terms of Reference
2	27 July 2023	Accept Work Plan, Scope and PMLU options
3	28 September 2023	Review BCA output and Regional Scoping
4	15 December 2023	Review Output of Economic model + MCA
5	2 February 2024	Update and Stage Two
6	15 March 2024	Review draft Stage One Report

Advisors:

Advisors were called upon in various stages of the project including formulation of the proposal, to seek specific advice at various stages throughout the project. Many were also involved in Workshops 3 and 4.

Advisors include representatives from:

- State Government: DEECA, DJSIR, DTP, LVMRAC, LVRRS, EPA
- Water Authorities: DEECA, Gippsland Water, South Rural Water, West Gippsland Catchment Management Authority
- Regional Development bodies: RDV, RDA, Regional Partnerships, Committee for Gippsland, One Gippsland
- Community Health and Wellbeing Organisations: Latrobe Health Assembly, Latrobe Health Advocate
- Labour agencies: Gippsland Trades and Labour Council, Workforce Australia, Victorian Skills Authority
- Key community groups: Voices of the Valley, Friends of Latrobe Water, Great Latrobe Park, ReActivate Morwell, Morwell Neighbourhood House
- Regional peak bodies: Food and Fibre Gippsland, Destination Gippsland, Gippsland Climate Change Network
- Educational institutions: FedUni, TAFE Gippsland, Gippsland Technical School, Baw Baw Local Learning Network

Advice was also sought from collaborating academics, including Prof Fiona Haslam-McKenzie, Prof Tom Measham, Assoc. Prof Rosalea Monacella, Assoc Prof Michelle Duffy, Prof Bruce Wilson.

Annex 2 List of Regional Development Plans and Strategies on Latrobe Valley and Gippsland Reviewed

1. Gippsland Regional Skills Demand Profile 2023 (Victorian Skills Authority, 2023)
2. Gippsland Freight Infrastructure Master Plan 2023-2028 (Committee for Gippsland & Regional Development Australia Gippsland, 2023a)
3. Gippsland's Clean Energy Future: Through Investment and Growth 2023 (Committee for Gippsland & Regional Development Australia Gippsland, 2023b)
4. Live Work Latrobe Housing Strategy, May 2019 (Planisphere & Latrobe City Council, 2019a)
5. Live Work Latrobe Industrial and Employment Strategy (IES), May 2019 (Planisphere & Latrobe City Council, 2019b)
6. Live Work Latrobe Rural Land Use Strategy, May 2019 (Planisphere & Latrobe City Council, 2019c)
7. Gippsland 2035: Latrobe Valley and Gippsland Transition Plan, August 2023 (LVA, 2023)
8. Gippsland Regional Climate Change Adaptation Strategy (GRAS) 2021 (Department of Environment, 2021)
9. Latrobe Valley Regional Rehabilitation Strategy (LVRRS), June 2020 (Department of Environment, 2021)
10. Gippsland Future Directions Strategy 2020 (DeltaPearl Partners, Regional Development Australia Gippsland, & Committee for Gippsland, 2020)
11. Gippsland Regional Plan 2020 (Committee for Gippsland, Regional Development Australia Gippsland, Regional Partnership Gippsland, & One Gippsland, 2020)
12. Hazelwood Concept Master Plan, June 2019 (Engie & ARUP Australia, 2019)
13. Gippsland's Future Health and Community Services Workforce Report, April 2019 (Abbott, Esposto, Perenyi, & Agudelo, 2019)
14. A Strength Led Transition: A Community Aspiration for a Strong, Sustainable and Prosperous Future, November 2016 (Latrobe City Council, 2016)
15. Review of Future Rehabilitation Options for Loy Yang, Hazelwood and Yallourn Coal Mines in the Latrobe Valley: Hazelwood Mine Fire Inquiry Final Report, November 2015 (Murphy, 2015)
16. Gunaikurnai Whole-of-Country Plan, April 2015 (Gunaikurnai Land and Waters Aboriginal Corporation and Native Title Services Victoria, 2015)
17. Aboriginal Economic Development Strategy Gippsland: Building on the legacy, August 2021 (Gunaikurnai Land and Waters Aboriginal Corporation, 2021)

Annex 3 Project & land use planning principles

Project Principles

- To adopt an opportunity, rather than deficit or risk mitigation narrative
- Consider regional benefit (not site specific – although may be nuanced)
- Cumulative benefit (social, cultural, environmental, economic)
- Positive legacy
- Options must be feasible (including safe, stable, sustainable)
- Traditional Owner aspirations and direction explicitly included
- Transparency of process and outcomes
- Outcomes will be available for use by all stakeholders
- Builds on existing work already undertaken on regional development and community values
- Work seeks alignment with existing processes – and provides alternatives where these are not fit for purpose
- Conditions of data sharing understood and adhered to
- Chatham House rules for stakeholder consultations and within workshops.

Land use planning principles

In determining future land uses for the land parcels, some basic principles were adopted to assist in future planning scenarios. Adopting these principles provides some guidance as to how a future land use can be considered for a site and provides some assurance for stakeholders in the transparency of the process. Principles include the following:

- If identified assets exist on a parcel of land, future LU should maintain and enhance these (including TO rights and aspirations)
- Proposed land use is not incompatible for the land available
- Land proposed for a particular future LU should be considerate of future need
- A compatible/synergistic set of LU recommended – regional approach
- Consider restrictive impacts on future LU
- Multiple land use mixes across the sites
- Staged approach to realisation
- Assumptions about presence or absence of ‘regional’ infrastructure should be specified prior to analysis of PMLU mixes at site level
- Assumption: coal mining on these sites will cease with the closure of the power stations. (Although we acknowledge the potential future uses of lignite, the scope of analysis does not explore such futures.)

Annex 4 Participant survey

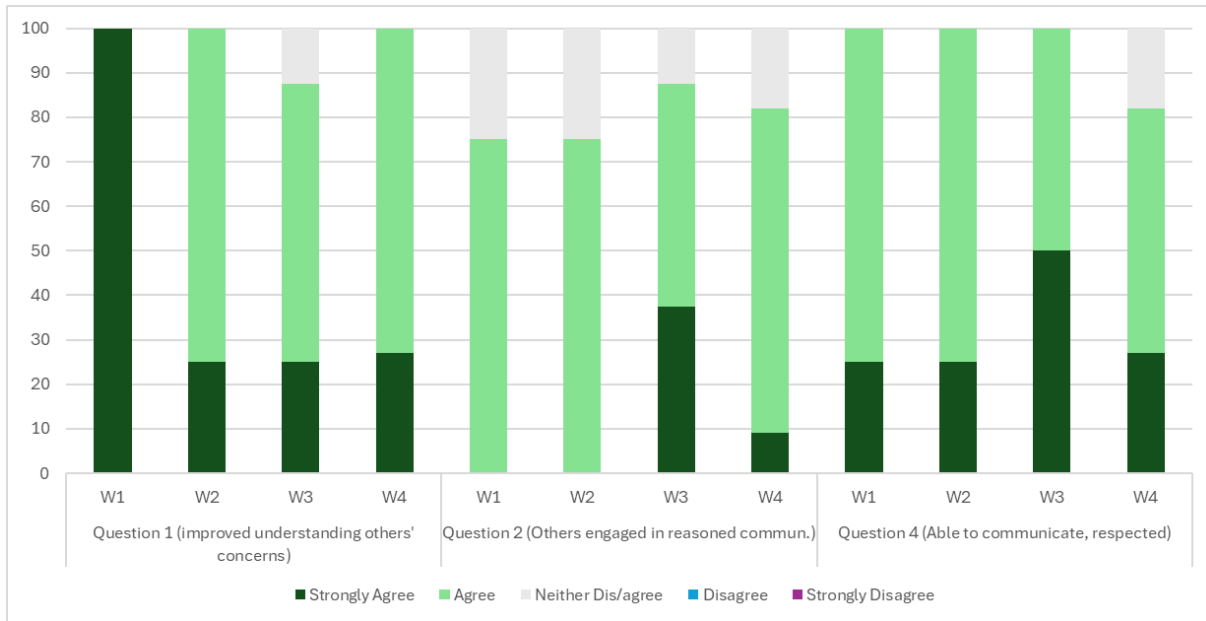
Survey instrument

Table 9: Survey instrument

QUESTION NO.	COLLABORATIVE DYNAMICS COMPONENT	SUB-COMPONENT OR ADDITIONAL COMPONENT	WORDING
1	PE (Discovery)	SM (Mutual understanding)	My understanding of some challenges and concerns held by other participants has improved.
2	PE (Deliberation)		Other participants usually communicate reasons to support their statements.
3	SM (Mutual understanding)		I recognise and respect that other participants have legitimate interests, which may differ from those of my organisation.
4	PE (Discovery, Deliberation)	SM (Mutual understanding)	I was able to communicate the concerns of my organisation at the workshop and was treated respectfully by other participants.
5	PE (Discovery)	CJA (Leadership, Procedural arrangements)	When I communicate matters of concern to the study team, I feel I am heard and given a reasoned response.
6	CJA (Knowledge)		I feel comfortable that the framing of the project will provide a viable framework for a meaningful analysis.
7	SM (Internal legitimacy)	PE (Definition)	I want to contribute to the project's aim of defining a shared regional vision for post-mining land use.
8	CJA (Knowledge)	SM (Internal legitimacy)	I am interested in deepening my understanding of the various impacts (eg, economic, social, environmental, financial) associated with alternative land use options or scenarios
9	SM		Success for this project will require collaboration between different actors, public and private.
10	CJA		I am confident that the study team and the project's sponsors (including my own organisation) can put together the functional 'assets' needed for successful project delivery (assets such as leadership, resources, knowledge to support deliberation, and effective project design).

Source: Authors. Notes: PE = principled engagement; SM = shared motivation; CJA = capacity for joint action.

Survey results – principled engagement



Source: Authors. Notes: Columns show %. Full wording of survey questions shown above. Response rate: Workshop 1 (n=4/11); Workshop 2 (n=4/9); Workshop 3 (n=8/21); Workshop 4 (n=11/24).

Figure 14: Survey responses to questions related to principled engagement



Australian Government
Department of Industry,
Science and Resources

Cooperative Research
Centres Program

This project is supported by the Australian Government Department of Industry, Science and Resources through the Cooperative Research Centre for Transformations in Mining Economies.