

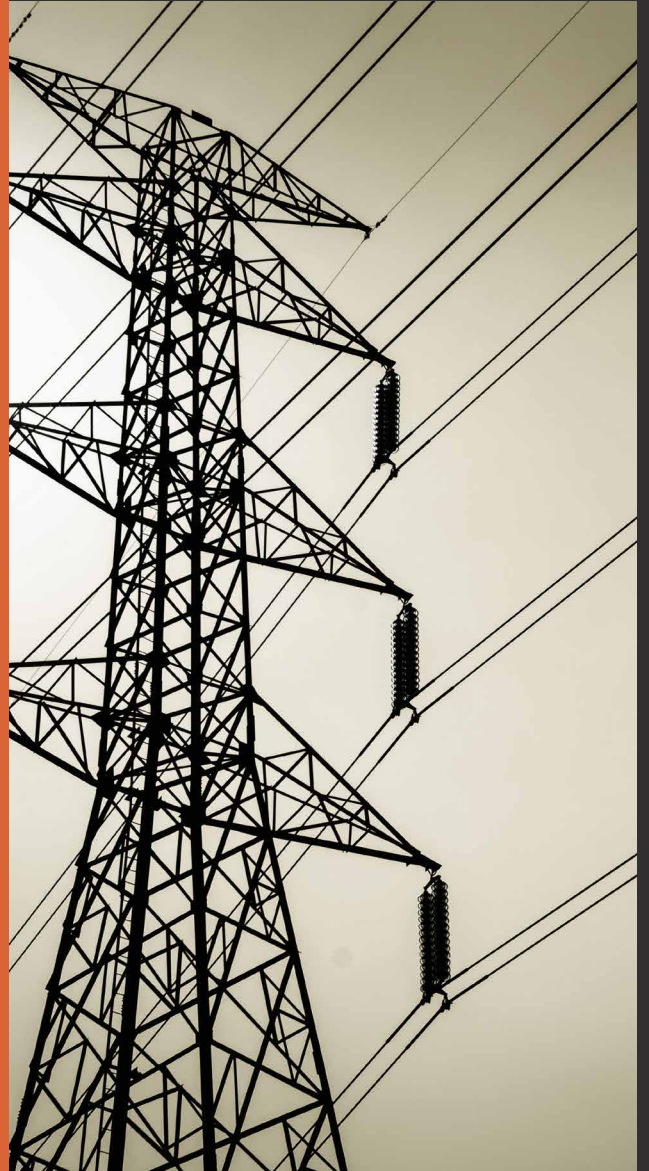
SEPTEMBER 2023

2.

Co-design Workshop Findings

Comparing high voltage
overhead and underground
transmission infrastructure
(up to 500 kV)

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Members of Powerlink's Customer Panel

Who guided us through the research design elements of the project

Report Reviewers

Who generously gave up their time to provide much needed feedback on the report and chapters

1.

Introduction

A three-hour co-design workshop was convened with key stakeholders from Powerlink's Consumer Group to help advise the research team. The aim was to assist the research team in ensuring potential knowledge gaps and subsequent priority research questions were accurately identified. This was seen as an important step to inform the systematic literature reviews across the target areas (technical, economic, environmental, social and community).

In total there were seven participants from the consumer panel, two representatives from Powerlink and four of the technical experts from the research team participated. Chief Investigators, Ashworth and Ackermann, guided the workshop process.

2.

Workshop Design

The workshop commenced with a brief introduction to the project and the purpose of the workshop along with short introductions by each participant. The workshop then moved on to the substantive part comprising the following steps:

Step 1

Participants were asked to identify what they saw as “*The top 3 issues and opportunities relating to either overhead lines (O) or underground (U) cables*”? using *Strategyfinder software*¹. Participants were asked to tag their contributions with either an O or U depending on whether they related to overhead or underground. In many instances, the issue/opportunity related to both and therefore was not tagged. During the process of generation, the facilitator clustered the material into rough themes.

Step 2

To review, augment and elaborate on the captured themes, the facilitator openly reviewed each of the clusters, ensuring participants became familiar with all the contributions and either confirmed or suggested changes for the location of contributions in the theme they were situated within. Following this, each of the themes and associated clusters were explored in detail, with participants suggesting further issues and opportunities, identifying causal links, and elaborating statements so that they were clear to all.

Step 3

To help prioritise the themes in an effort to identify which were the most important, each of the theme headings was individually rated on a scale of 0-10. Participants were asked to position one theme at 10 (highest priority) and another at 0 (lowest priority) reflecting relative positioning. They could then rate the remaining themes according to these two anchor points. Participants were then able to view the results along with the degree of consensus about the rating.

The workshop concluded with the facilitators thanking the participants and outlining the next steps.

¹ Strategyfinder is a server-based software program that allows all participants to contribute from their own location anonymously and simultaneously. In addition, through an embedded modelling technique, causal mapping, participants can see how different contributions impact each other building chains of argument and ultimately a network of linked statements. As such, participants are able to explore the thinking of others, delve deeper into their own views, and have a structured conversation. The network is analysable allowing for the management of content and the detection of emergent insights. Prioritisation tools are also available.

3.

Outcomes

From the initial gathering of information, 8 different themes emerged. These are reflected in Table 1 below. The first column shows the number of supporting statements that emerged in each theme, while the following columns, provide the mean and standard deviation of combined scores. This illustrates the priority and degree of consensus across each of the themes.

Social licence and impacts on landholders and communities received the highest average score and the highest degree of consensus. *Ensuring new transmission has minimal environmental impact* was the next highest priority followed by *Community consultation and engagement*. Both of the latter two are key constructs and considerations for achieving a social licence to operate. This reinforces the importance of the people and social aspects in achieving new transmission upgrades regardless of whether they are overhead or underground. It must also be noted that there were a very small number of participants within the workshop so priorities must be read with caution.

Each of the themes are expanded upon below with the series of causal maps arising from the study included at the end of this chapter.

Social licence and impact on landholders and communities was the most highly prioritised theme. The statements surrounding social licence focused around a number of key issues, which reflect much of what has been written in the literature on gaining and maintain a social licence. For example, balancing the global benefits that renewable energy projects bring along with the potential negative challenges for local host communities. This issue arose in several variations and of key concern was the observation that there is a growing scepticism around renewable energy projects, with some suggesting they were losing broader support because of the associated negative impacts, such as visual amenity, impacts on biodiversity, and disruption to day-to-day operations. It was suggested that this was also exacerbated by the short time frames and urgency surrounding the need to deploy renewable energy

Table 1 Key themes emerging from the workshop and their relative priority ranking

Theme	No. of Supporting Statements	Mean	SD (Degree of consensus)
Social licence and impacts on landholders and communities	33	8.9	1.1
Minimising environmental impact	34	7.6	2.2
Community consultation and engagement	35	7.5	1.4
First Nations engagement and benefits, FPIC	12	7.2	2.5
Corridor selection and securing land access	11	7.2	1.6
Whole of life cost	10	6.7	2.9
Speed of delivery and need to build a lot	13	6.5	1.7
Building a smarter more resilient grid	6	6.0	3.5

projects. This led to a suggestions that processes for engagement were emerging that potentially lacked elements of procedural fairness, distribution of benefits and ultimately failed to build trust in the process. The fragile nature of social licence is best reflected in the statement below:

Social licence is like an accumulated savings of goodwill (or ill-will). You can gradually build (sp) it up and also burn it very quickly.

Community consultation and engagement highlighted the need for effective communication between project proponents and impacted communities. It was suggested that this line of engagement should promptly and clearly engage with community concerns and points of misunderstanding to minimise the risk of consultation fatigue amongst locals. The formation of community networks or representative groups as key points of contact for proponents and community were seen as being key. Not only was this raised as being a way to ensure continued local engagement with projects, but it was also seen as a method of building capacity within the local community. This was also considered important to address misinformation which is a key issue for the Victorian projects. An overarching emphasis on making participation in consultation palatable for local populations emerged, with statements calling for engagement that goes beyond just gathering views and attempts to reconcile project ambitions and decision making with a level of local opinion.

Ensuring new transmission has minimal environmental impact recognised there are multiple trade-offs that will influence the choice of overhead or underground transmission lines. Not least whether it involves the upgrade of a pre-existing transmission line or building new lines. This in turn leads to considerations of existing land use or a need for additional land for more or wider corridors. Therefore, raising concerns around competing land-use issues. Other considerations for minimising environmental impacts included considerations of bird life, water, the need to dig trenches, bushfire potential, and others. Similarly, there were statements around the physical differences between overhead and underground lines and the associated visual amenity of these. There was a question whether distributed energy might provide better solutions in some areas and also the importance of education for the short and longer term as new projects come online. EMF was a concern that was raised in the discussion not only for environment but also around health and safety considerations.

First Nations engagement and the benefits of Free, Prior and Informed Consent highlighted the opportunity to improve on existing engagement frameworks with First Nations, pushing for more effective strategies that allow for greater levels of empowerment amongst communities affected by projects. This should take the form of incorporating the priorities of First Nations into the design of transmission infrastructure. As well as through training and capacity building of these populations in regard to how they can participate in projects. It was stressed that the unique and varied First Nations' perspectives need to be understood both in regard to how individual communities engage with projects and the potential benefits they might accrue from being involved, as well as considerations of site specific environmental and cultural significance. It was felt that consulting with Elders may help engagement frameworks better reflect different First Nations' priorities. The discussion also highlighted potential points of issue, particularly in regard to how consultation with First Nations communities in different areas may slow decision making and how this could be minimised by learning from and improving upon past failings and successes of the resources and main roads industries.

Corridor selection and securing land access called for an examination of the differences in reliability and operational impacts of overhead versus underground lines and an investigation into whether implementing new infrastructure or replacing old would be the most effective way forward. This theme emphasised trying to find the balance between the necessary impacts associated with the construction of infrastructure with outcomes that will be satisfactory for those hosting lines and their neighbours. In line with this, a few points were raised including skirting property boundaries to minimise impact across farm land, taking into consideration hosting farmers' biosecurity concerns and requirements for the parties that are going to be using their access tracks, as well as how to manage levels of compensation beyond just host individuals. To secure land access, enhanced landholder payments that have been implemented in Victoria and New South Wales serve as a model to help encourage farmers to become involved in projects. In terms of selecting corridors, recognising the context of locations in terms of their reliability, their vulnerability to extreme weather, and their ability to be repaired and maintained were raised as points that should guide decision making around where projects are built.

Whole of life cost looked to explore ways that the costs of underground and overhead line projects could be minimised both in the short and the long-term. Immediate concerns like the cost of building and operation between the two types of lines were raised with consideration of sunk costs that may emerge if either was constructed at the wrong scale or in the wrong location. In addition, environmental impacts, supply chain issues, and the cost of payments to host communities were also highlighted as needing to be considered in regard to how their situations might change in the future as these projects are carried out. The continued management of costs through good project management that takes advantage of new technology and construction methods was seen as being a key tool in ensuring this. Another idea that emerged in this discussion was the opportunity to coordinate between electricity markets and their subsequent budgets as a way to potentially minimise costs for all involved.

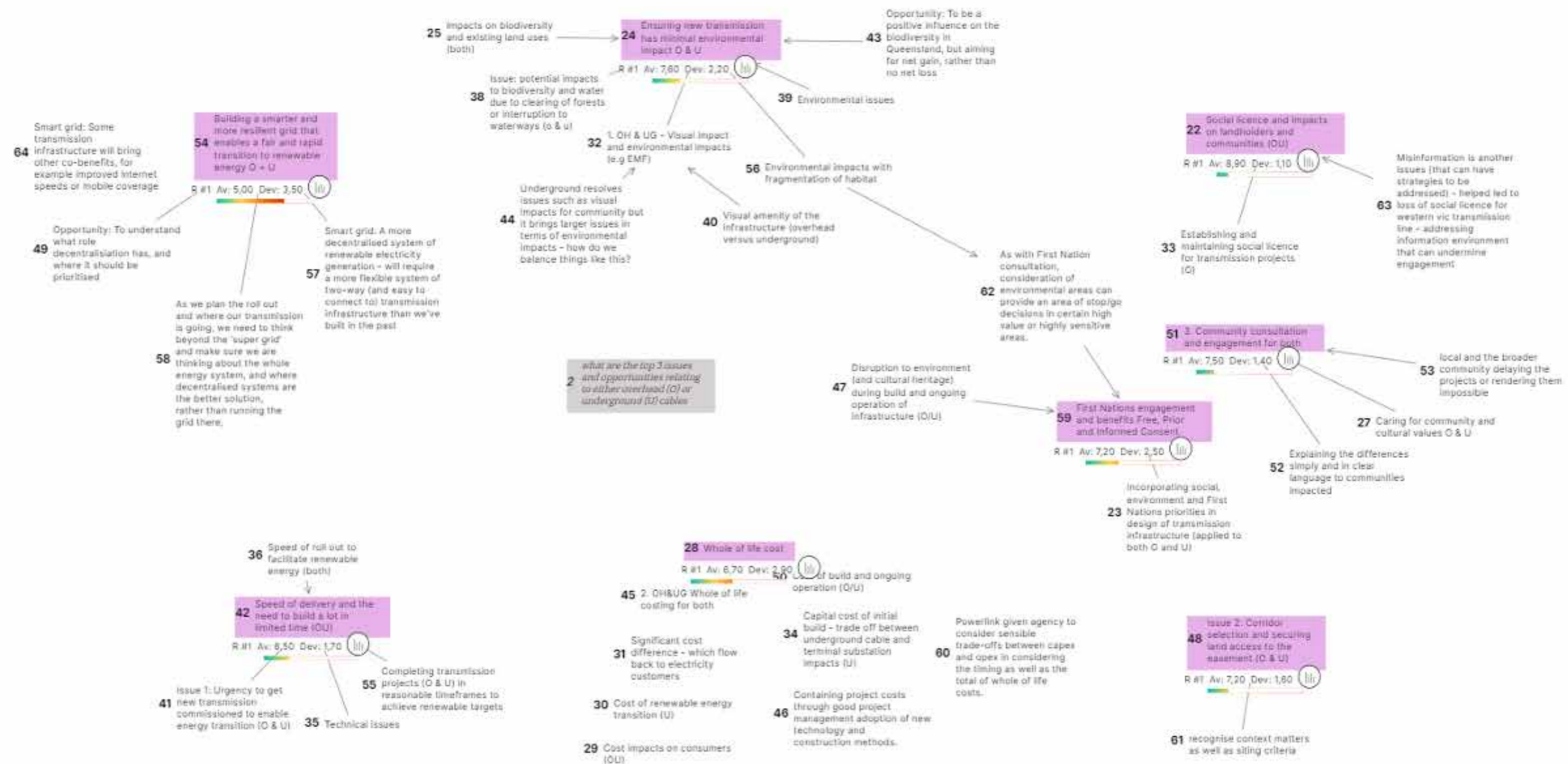
Speed of delivery discussion focused on understanding and weighing the trade-offs between underground and overhead lines and their process of implementation. Recommendations on how this comparison should be carried out took the form of examining differences in financial and temporal costs, the different necessary approval processes, required associated training and development, resource constraints, and the speed of roll out required. Case studies, including that of Germany, the EU and Western Victoria may provide further insights into this. A consideration of labour shortages and competition for workers with the required skills, both domestically and internationally, was also seen as a further important aspect impacting the overall process of implementation of projects. An overarching emphasis emerged highlighting the importance of fact-based analysis that clearly and transparently balances potential costs with the ongoing considerations of each project, so as to allow the most effective roll-out of projects.

Building a smarter and more resilient grid to enable fair and rapid transition highlighted the necessity to look at the transmission roll out within the energy system as a whole. In this light, thinking should go beyond just the “super grid” and recognise where opportunities for alternative decentralised infrastructure might be a more viable option than transmission. Such a decentralised system would require more flexible infrastructure than has been previously used which has the opportunity to introduce other co-benefits such as improved internet speeds and mobile coverage to these communities. The Renewables Grid Initiative in Europe addresses decentralisation in regard to underground lines and may provide insights into this different option. The decentralised alternative needs to be looked at in early consultation stages of a project to understand its viability in different conditions, how it changes regulatory requirements, and whether it fits into the scope of what is being carried out. In some cases it may be outside of a specific project’s control given that it should be explored before the point of choosing to build large transmission lines.

4.

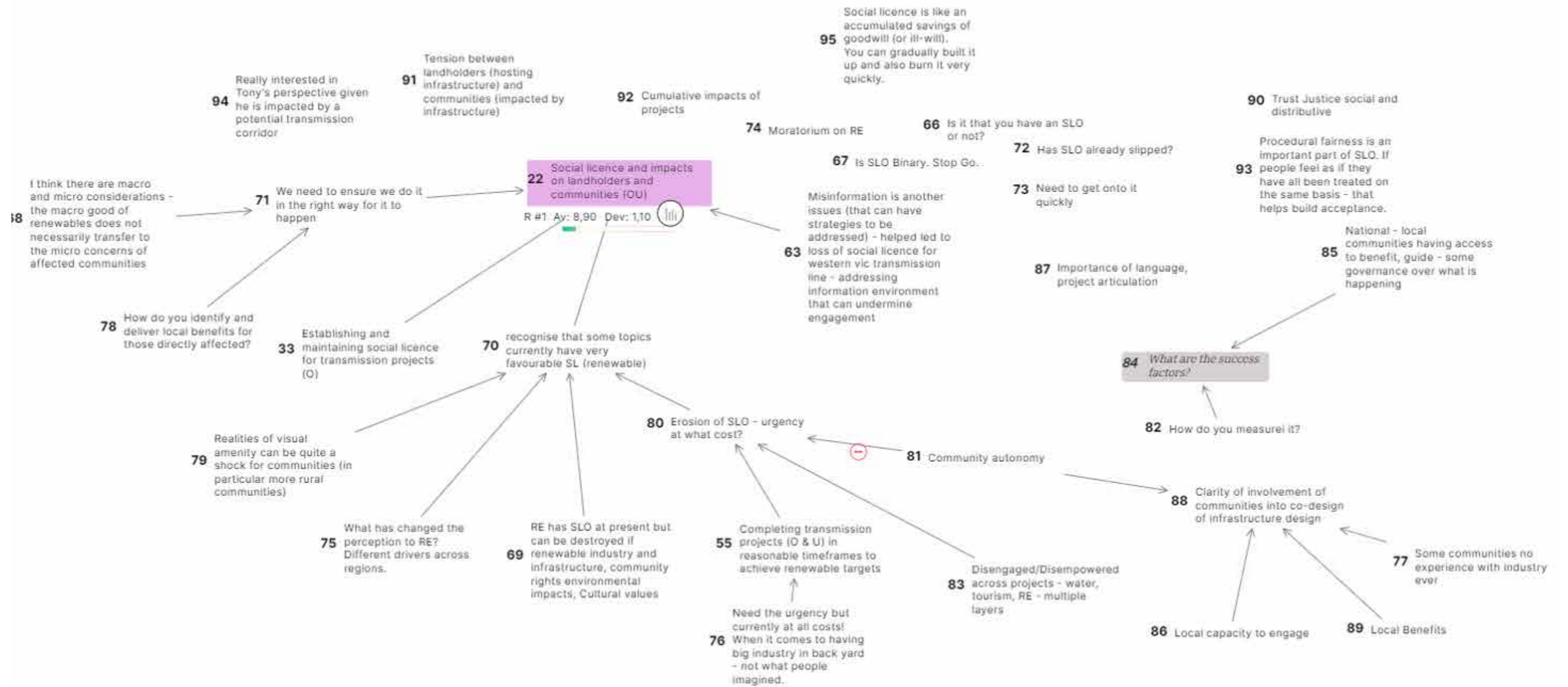
Causal Maps

Map 1: The initial capturing of information with rating scores (shown below each purple statement)

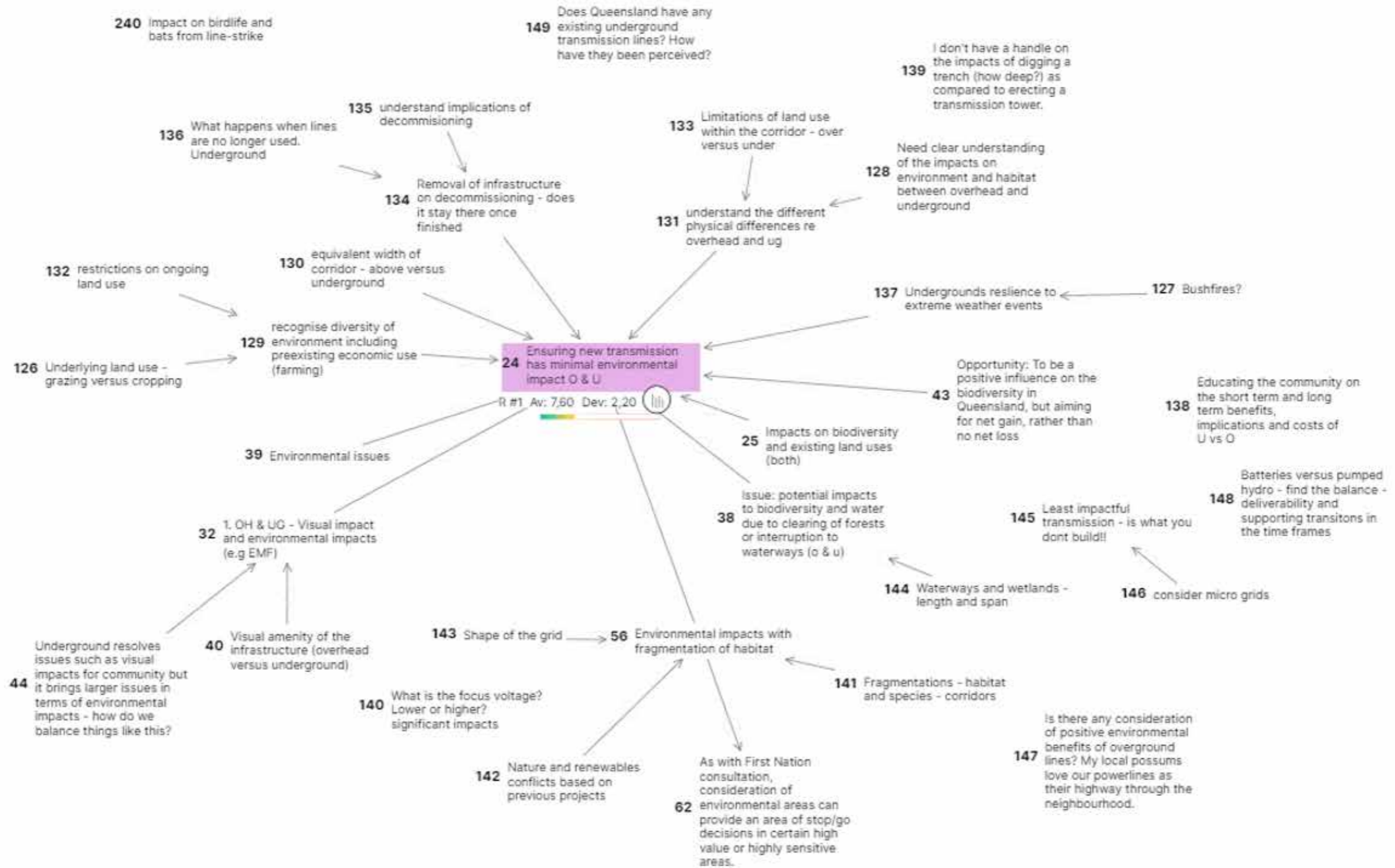


Note: themes are highlighted in purple (and each has a more developed map below)
Results of the Rating process are portrayed under each theme

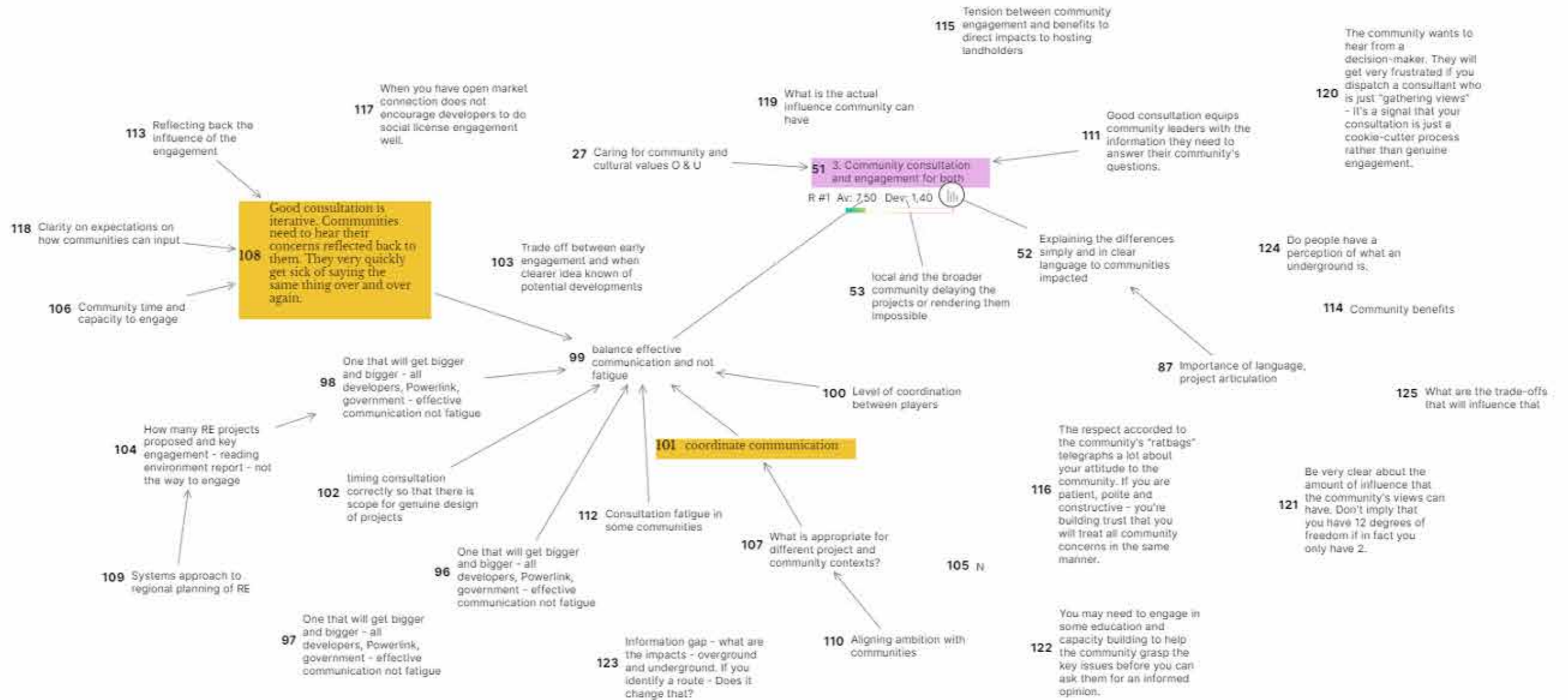
Map 2: Theme 1: material supporting the Social License theme



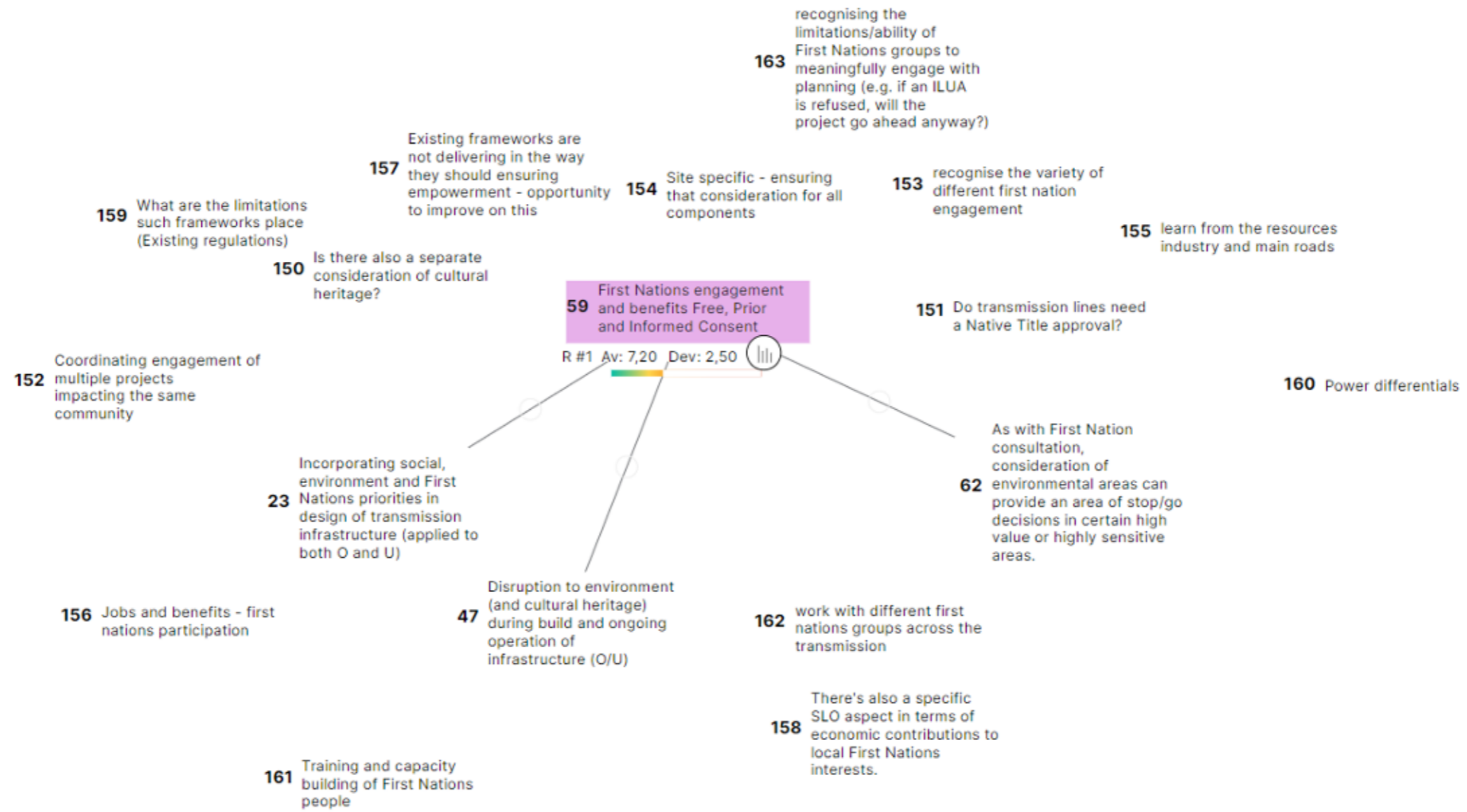
Map 3: Theme 2: material supporting the Environment theme



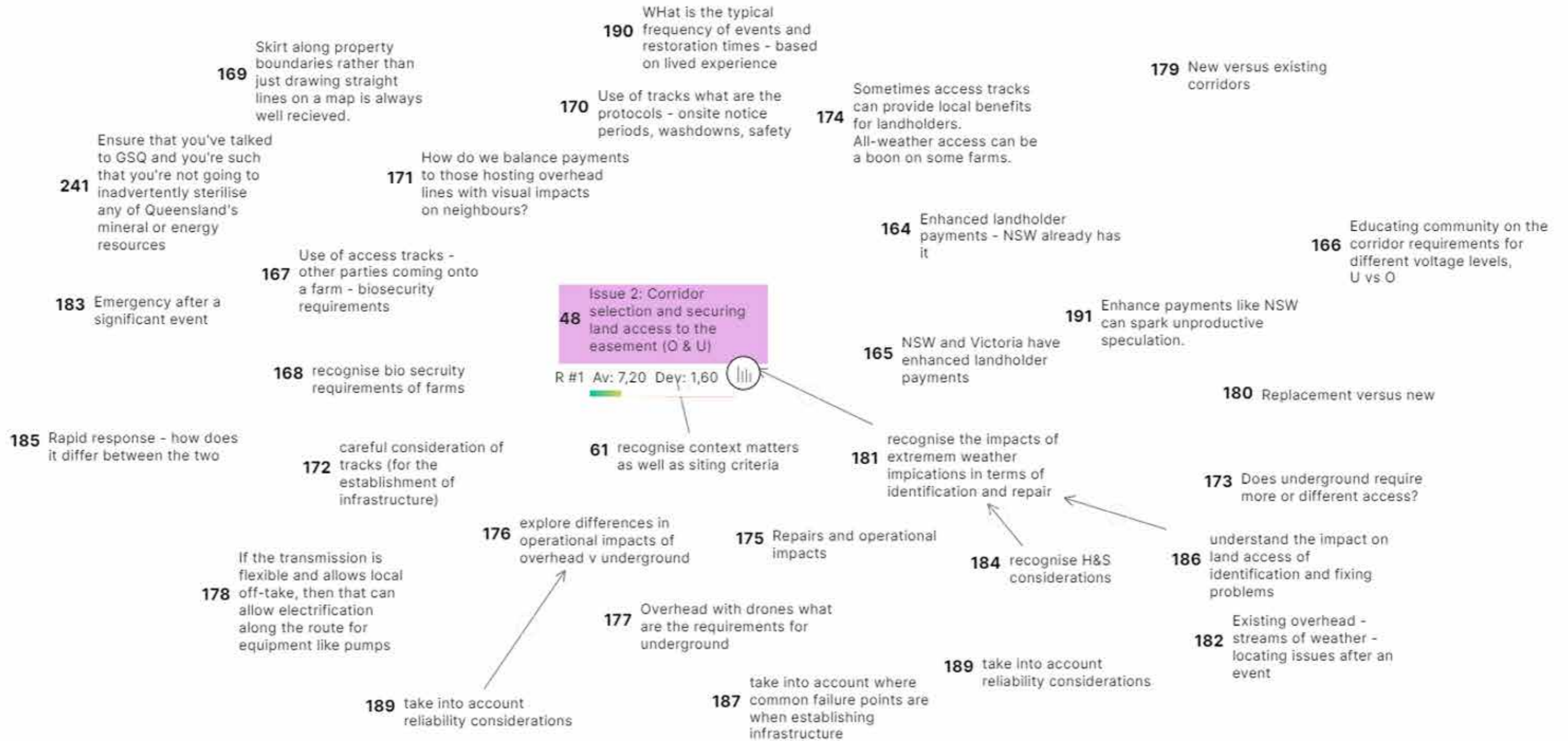
Map 4: Theme 3: material supporting the Community theme



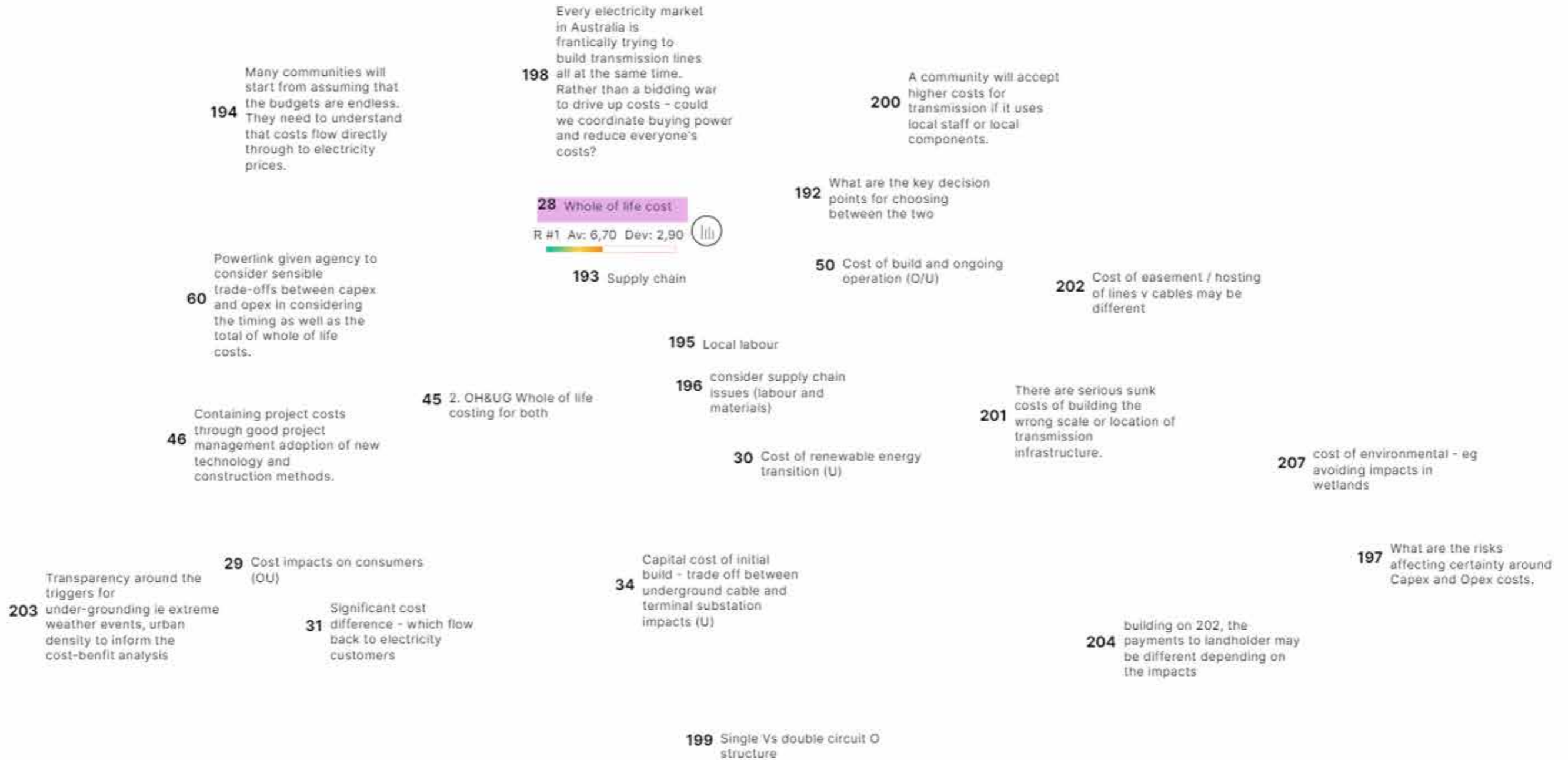
Map 5: Theme 4: material supporting the First Nations theme



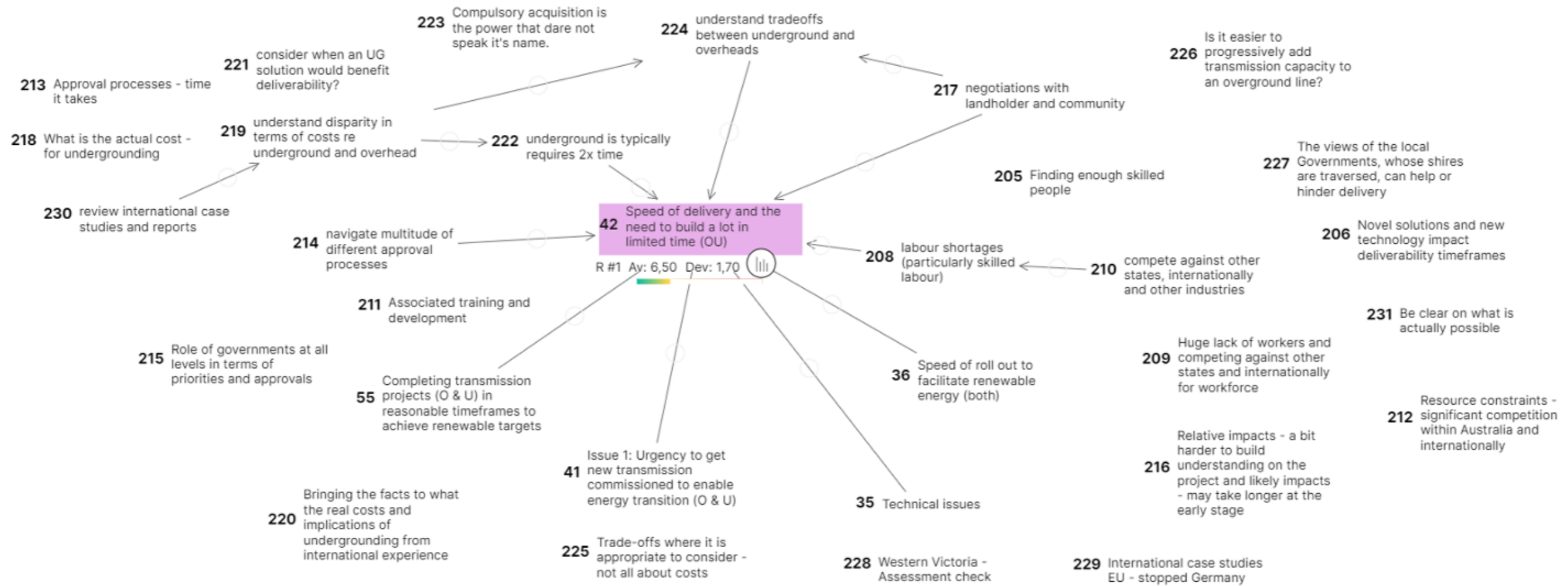
Map 6: Theme 5: material supporting the Access theme



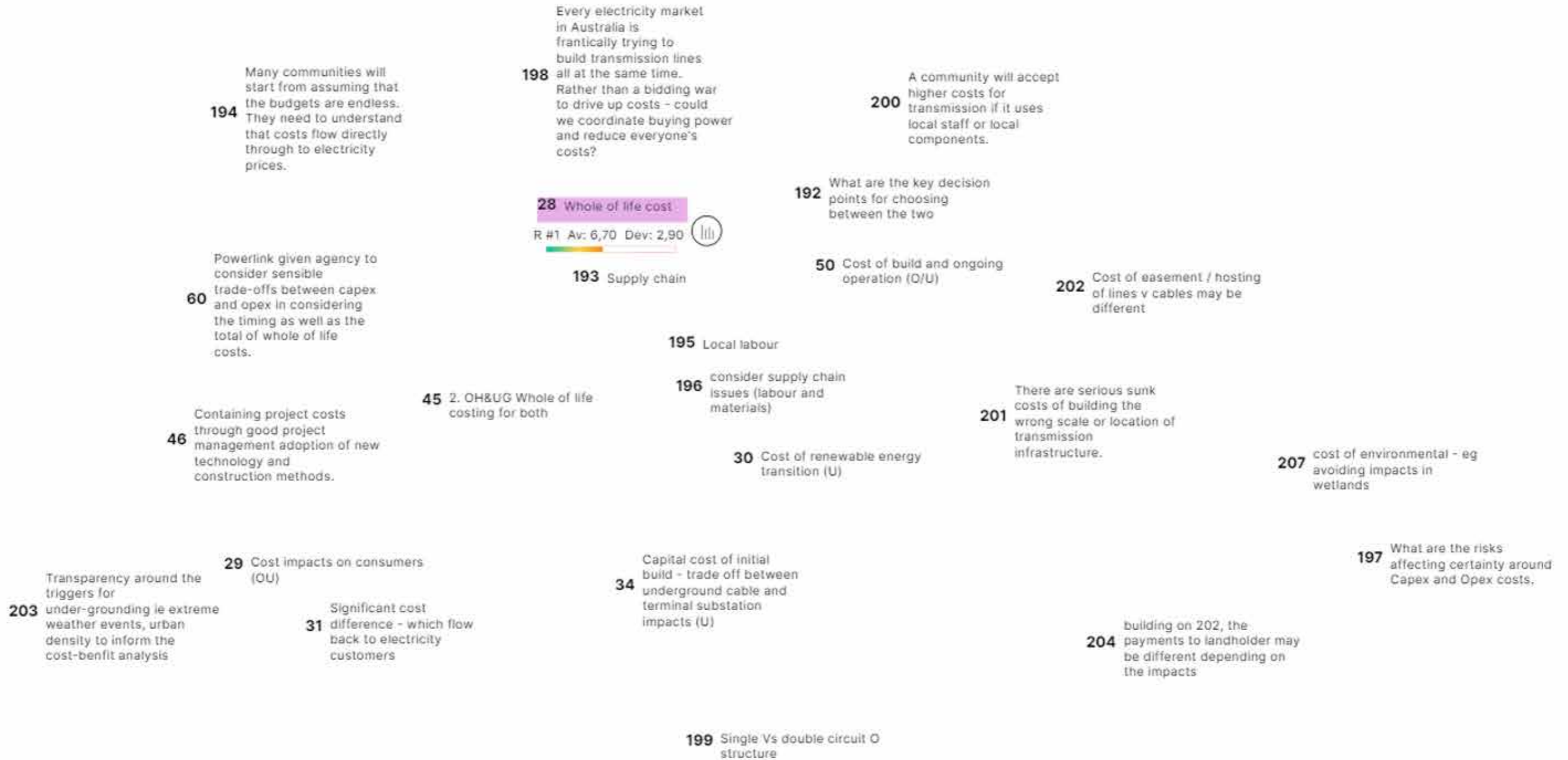
Map 7: Theme 6: material supporting the Cost theme



Map 8: Theme 7: material supporting the Delivery theme



Map 9: Theme 8: material supporting the Resilience theme.



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