

## Supplementary Material

### **Carbon and ecosystem service markets in rangelands and grazing systems are a wicked problem: multi-stakeholder partnership or roundtable as a vehicle forward?**

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# Supplementary material

## Supplementary material S1. Interview guide

Set guiding interview questions, which provided a basis for the semi-structured interview. This set of questions was provided to the interviewee prior to the commencement of the interview.

- What is your role and experience with the broad sphere of ecosystem service payments as they relate to agricultural and or grazing lands?
- What are some of the more successful aspects of schemes in the ecosystem services payment space?
- What in your experience contributes to this success?
- What challenges or impediments have you experienced?
- What are the key causes of any limitations or challenges in your view?
- If you were able to make modifications to the systems and that design and implementation, what would be your top three suggestions?
- Given the complexity of this sphere and that it is still emerging are there any issues you think we have missed in our discussion or the project?
- For these schemes to be on-ground “successful” in 10 years' time, what policy changes are needed to support them?

## Supplementary material. Table S1. Coding matrix

Table of all codes (parent and child) identified throughout the analysis, within NVivo 12 Pro (QSR International, 2018). The codes are arranged as seen in NVIVO software. Table includes the code name, a description of what was included within the code, an example quote from with said code, the number of identified references within that code, and the number of files those references originated from.

Theme	Code Description	Example quotation	Reference	Files
Attributes of a successful market	Factors or actions that contribute to a successful market. This may include suggestions for future changes (may have some overlap to the “Alternative ways” code. BUT these are only to do with the market) OR factors they have seen to work previously. Direct comments to with market functioning.	<p><i>“... make sure you've got free flowing form of consent. Where can you bolster the ERF methods at the moment, and then how can you make sure you got fair and equitable service agreements. Co-Benefits are recognized, and the seller has the same rights as the buyer sitting at the table...” (14)</i></p> <p><i>“Let's just go back and touch on again what makes a successful market. You absolutely need to have that clarity on what's the purpose? Need to have clear demand. So you need to have a dollars from somewhere to pay for them...” (29)</i></p>	20	14
Acknowledge reviews	What has occurred in the past that should be considered/ may provide insights to the current situation.	<p><i>“My sort of thinking goes to what role will sort of global forces like TNFD [Taskforce on Nature-related Financial Disclosures] play and just general overseas demand and overseas policy? What role will that play, is probably part of my thinking...” (23)</i></p>	21	12

		<p><i>“Things like I see TCFD, TNDF, SDGs, GRI. They are all going, we are just creating an existential crisis to deal with. It’s coming guys. Treasury is designing reporting for it now. SDGs have been out for what decade?” (33)</i></p>		
Suggested future alternatives	Alternative ways of approaching the ‘system’ and its functioning.	<p><i>“The ERF has all been designed about lowest cost abatement. Let’s flip it around and say, hey, let’s pay what’s right and fair, and let’s leverage this to get the maximum benefits to the environment or the maximum benefits for the indigenous people, then we could really see a completely different system.” (14)</i></p> <p><i>“ ... you are going to be the project owner, not a carbon service provider, you can put your project as part of this pilot, and there’ll be no audit requirements. And the regulator will provide various assistance with your project. So what they’re trying to do is provide an opportunity for landholders to run their own projects by streamlining what’s required.” (26)</i></p>	5	5
Community engagement approach	Comments around targeting or working with whole communities as a way of achieving greater impact or for combating small farm scale	<p><i>“... if you mesh environmental condition across every NRM body in Australia, you will have an Australia wide impact basically on the environment and that will really help landholders make those claims.” (16)</i></p>	17	9

	compliance issues.	<i>But in terms of the focus – it's still on individual adoption. Yeah, rather than engaging the community like there's still a lot behind the scenes they probably don't consider like rural decline was one of the things that was quite a big concern in the region affecting social fabric. (3)</i>		
Early Government support	The necessity of government to guarantee market funding with long term plan to step back. Government having the role as an initial driver / guarantor of markets and their initiatives.	<p><i>"...thing is getting the money out there to develop this needed part of the industry. Everything does cost money. Unless the Government puts money in it, it's not going to happen. There's no one else." (14)</i></p> <p><i>"So I think, in design and policy we need to see the government as mainly an enabler or a facilitator, not the end market operator." (21)</i></p> <p><i>"You generally need a government to do the first buying, because, same with renewables. You have a high risk issue early on. And government needs to prove the concept before the private sector will be willing to invest in it. Reasonable rates of capital return. You need that demand plan. So you need money upfront from government. You need a plan to step back." (29)</i></p>	15	13
Giving the system time to	Allowing time for the biophysical system to respond to policy settings.	<i>"I think it takes a couple of goes before you get something that strikes the right kind of balance between complexity and rigor and certainty... It's</i>	23	15

respond	Allowing time for the results of certain actions to be realised and learnt from	<p><i>taken kind of twenty plus years for them to take shape, and there's still room for improvement, as I understand, in those markets. So it's probably naive to think that you can just design it and get it right the first time. It's going to take a bit of to-ing and fro-ing for us to get this right as well, I think certainly for complex things like biodiversity." (1)</i></p> <p><i>"So there's a sort of impatience on the side of the funders, and politicians are also right there of course, because they want to see their brave choice to put five hundred million dollars into a fund and have it go to landholders, kind of instantly turn into success overnight. All of that stuff is kind of threatening the longevity of these programs. People need to be patient, I think." (1)</i></p> <p><i>"So I think in the carbon space things have progressed. Well we've learned a lot about regulation of these markets generally, and I think government has worked quite well in working through and improving over time, nothing's ever perfect the first time you put it out." (18)</i></p>		
Monitoring, reflection, and	The need for monitoring, reflection and feedback of these systems. That we	<i>"But we should have someone Q&amp;Aing these new and emerging technology manufacturers, going to their factories, eyeballing them, looking</i>	19	12

<p>feedback needs</p>	<p>need to learn from what has been done/ occurred. Call for more reviews or feedback</p>	<p><i>at their quality management systems, making sure they got decent documentation in place, doing all the back office checks. And then also having a QA register for people who are providing services...” (10)</i></p> <p><i>“I think it’s just that we need to continually refine and move on.” (24)</i></p> <p><i>“And even then, there’s likely to be things going wrong. So again, there needs to be scope for performance review, so that we can fix them as we go.” (27)</i></p>		
<p>Barriers</p>	<p>Barriers to programs/ schemes/ funding (e.g. LRF) and markets. The complexity of the markets, payment mechanisms and programs acting as a barrier or deterrent to participation. Beyond the scope of a landholder to comprehend / invest time to understand/ comply.</p>	<p><i>“A., it’s super expensive, and B., they not sure whether they’re actually going to be audited and get through the audit. I think that actually means that in terms of contracts management and policy, they get people who are super interested, but I think it’s a big barrier for a lot of people as well.” (11)</i></p> <p><i>“I think first of all, the idea that it’s just easy for a landholder to run an EFR project by themselves is absolutely floored, and a huge risk to them as well. It just doesn’t fly given the complexity involved. The regulation the needs to be met, which does come with it civil penalties if the compliance</i></p>	<p>45</p>	<p>18</p>

		<p><i>isn't where it needs to be. Yeah, there are problems with that argument.”</i></p> <p><i>(19)</i></p>		
<p>Community perception or pressures</p>	<p>Fear of what the community will think/ repercussions. Not wanting to go against the grain/ needing to conform.</p> <p>Your reputation/ perceived alignment with ideologies. Seeing what your neighbour is doing and how that will influence your decisions.</p>	<p><i>“...part of that's just the kind of contagiousness of a good idea, or that sort of word of mouth. What you would have is your preconceived model of how an opportunity is going to penetrate a group of landholders; it'll be by word of mouth, and opportunity can spread contagiously, and part of it's also just because the opportunities are also likely to be spatially contained.” (1)</i></p> <p><i>“I mean one of the really early studies that looked at regenerative farmers, on their well-being statistics, they were off the charts on everything except where they felt safe in their community because they still felt they were ‘the weirdo in town’ by managing their property differently. And we actually need to change that around and for farmers to experiment with regenerative as being the norm. And for the guy who's high input or still liquidating natural capital to become the weirdo.” (18)</i></p> <p><i>“And so there's a lot of “them and us” in the farming community. A lot of peer comment and peer suspicion.” 11q(21)</i></p>	15	10



Farm scale	The size of a property impacts the appropriateness or eligibility to participate in markets, payment mechanisms and programs.	<i>“Things that you constantly come up against is - certainly for biodiversity projects, but the same is true for carbon planting projects. There are all sorts of limits in the supply chains out there in terms of that capacity to scale.” (1)</i>	17	15
High cost	Market access and costs associated with its access/ compliance. This also acting as a deterrent/ barrier/ risk.	<p><i>“The other major issue there is that, these can be very expensive systems to operate. And you hint to that, and I've also talked about it in my document, and that it's directly impacting on inclusivity and scalability. Basically a huge amount the potential value from these schemes is going into transaction costs supporting measurement, monitoring, contracting. Which means that there's very little value going back to farmers or landholders; low incentives. And basically all of its green washing. Because there is no incentive to improve anything. So the only things that come out of it are things that can be sold.” (27)</i></p> <p><i>“Whereas the fantastic scientists go, every single transaction needs to be absolutely right. And so they design a metric and an evaluation approach where you basically eliminate all risk by just over killing all the evaluations and that pushes up the cost, and that becomes an impediment to</i></p>	26	14

		<i>participation especially for smaller landholders.” (17)</i>		
Risk to long term viability	long term contracts. variability in land ownership. risk to non-compliance through lack of understanding / poor initial planning and budgeting / extreme weather. Risk of environmental fluctuations and how that may influence your compliance	<p><i>I think smaller farmers are frustrated and skeptical, because they might be at that marginal scale of whether they can run a carbon project, it's complex and confusing, and they hear horror stories and a lot of risk management about, “will I need to pay back my ACCUs” and stuff like that. That sort of prevails as well at the smaller end of town, at the bigger end of town that again, it's probably the risk management side of things.” (23)</i></p> <p><i>“... they are frustrated by how short term some of the opportunities are. But there's also a real sense of ... analysis paralysis. Where there's just there's so many opportunities that they're being told about. That might be here in one year or two years or five years, and they know that the decision that they make today might rule them out of participating in some of those future and emerging opportunities. So there's a sense that, maybe a bird in the hand isn't worth two in the bush. Maybe the better bird is still in the bush, and they're gonna catch it next year. They're sort of waiting to see, and don't want to fire their shot too soon.” (1)</i></p>	46	22
Chubb's review	Direct comments about the Chubb	<i>“I think the Chubb review is probably going to show there is great need for</i>	32	18

references	review.	<i>government regulation in this space and oversight.” (13)</i>		
Crediting	Suggestions or complaints about the current state of credits. Should there be more crediting options / recognition.  Standards surrounding giving credits.	<i>“Regulatory innovation needs to recognize that these can’t be used as offsets. They can only be used as credits towards positive change.” (31)</i>  <i>“The ability for credits to be shared across actors in the value chain. So this push now for reporting of scope 3 emissions, we’d like to see the reverse of that, in terms of if we generate a credit. The fact that becomes someone else’s scope 3, should also allow them to incentivize us to generate that credit.” (15)</i>	17	12
Off-setting or In-setting	Discourse around offsets / insetting and their appropriateness. What is the best way to make use of your carbon credits. Is one more appropriate than another?	<i>“But make a move towards a more carbon in-setting. So a carbon in-setting process for the carbon offset generated, but they’re sold through the supply chain. So the method of how you measure, and everything is still done independently by people that don’t benefit from the sale of these offsets, or the number of projects going through. But the supply chains start to take more of an approach and more of an interest in the sustainability credentials at the farm gate through carbon offsets. Now they use the Government’s protocol, and they apply that, but they pay the farmer the premium for their products for the carbon offsets being generated. and I think that’s the future of carbon offset. It’s in-setting.” (20)</i>	30	17

		<i>"I think the markets will help with education and transparency, and potentially open up things like corporate philanthropy. Which will be the other way to avoid the offsetting. So if Mcdonald's not saying we've destroyed this much of land, but we've got these certificates, I don't think that's healthy." (23)</i>		
Complexity	General comments that talk to how complex this sphere of stuff is.  Sections of text that speak to a number of ideas which outlines how multifaceted these markets are.	<i>"I think economists and also some policy people in general, don't grasp ecological complexity. Sometimes I think we are taught a very simplistic view of how markets work and how they can work, and we have some great examples we use over and over again of the ones that have worked. We don't quite understand how complex it could be, especially in the environment in Australia, which is a very different place to Europe." (13)</i>	11	9
Jurisdiction	In both a political sense but also an industry appropriateness. Who is the right actor heading particular components of the market. Issues surrounding current heads or industry	<i>"So I think it's a combination of industry and Federal government, and I'm not sure to what extent the States need to play. I mean the States have been playing into this in the absence of the Coalition taking it on basically. You've seen the State step in because I got the shit's waiting for the Feds." (10)</i>	55	26

Risk	<p>Comments around the risk. Risk to the viability of these systems of the players within them. The risk associated with engaging in these markets. how these markets / opportunities de-risk your farm/ system (income variation, recognition by banks). - 'another leg to stand on' Comments around the risky nature of these markets. Risk mitigation</p>	<p><i>“It is about parametrising risk. What is the risk of an action versus the risk of some action today. That’s a society discussion, which incorporates societal views. But I think risk is also a markets’ question, right? Markets when they identify and can parameterise, can price risk.” (31)</i></p> <p><i>“So it's one of those things now, where people are saying it's just another revenue option. It's just another transaction. It's a way of diversifying our income risk. And so where you actually have people that are business savvy, they're not so negative looking at those some of those transaction costs because it's just another way of accessing a new cash flow.” (17)</i></p>	23	11
Consolidation	<p>Currently a very divided / sectional system. The need to simply through a universal system. This could be talking to carbon and biodiversity OR funding schemes / programs OR state based initiatives more federally driven</p>	<p><i>“think the timeframes at the moment for the different contracts are all on different timescales, and you can't stack them. We've got reef credits on 7 years. We've got carbon on 20 or 30. So we've got different timescales for different environmental outcomes. even if you decided on your property that you wanted to dedicate a certain portion to environmental services or ecosystem services. How you manage that when they're all on different contracts and different contracting requirements and auditing processes is actually... so I think there needs to be some sort of standardized approach across different ecosystem service offerings.” (11)</i></p>	39	21

		<i>"I mean what's required is a universal standard." (2)</i>		
Integrity	How much does integrity cost? Are we willing to pay for it? Getting that balance right. How does the price of something influence its perception/ trust worthiness? The need for data/ examples to provide trust in the system / not being able to access data. What has been done where? Why can't we access it? How do we know things working ?	<i>"More like accuracy versus cost. That's what it whittles down to. I can give you the perfect answer. But are you going to be willing to pay for the time and energy to get it?" (10)</i>	38	17
Policy	Comments about policy that don't necessarily fit into another code. Also because this project is policy orientated.	<i>"... going back to policy, so one, I think this should be a fiscal incentive, a policy mechanism that looks at financially incentivizing new technology options." (10)</i>  <i>"... we're right or in a muddle really. Because we're only just getting up to the legislation stage. So we're not compliant. But then we're not wholly voluntary. So we kind of sit in the middle, which gives us some strength,</i>	30	19

		<i>but some weaknesses. So I guess to a certain extent we really need to get that bit of the policy sorted out first, and I guess we're addressing that through the safeguard mechanism at the moment.” (14)</i>		
Regulation	Regulation needs to help simplify or clarify the system.	<i>“So my sense is that the whole ecosystem services-carbon markets are probably very much like the early days of the banking systems, in the 1930. We've got a whole rogue, a volatile emergence of some with very good intent and good rigour, and others who are in to make a buck. And particularly in the carbon market, there's big bucks to be made, particularly with this net 0 targets, over the next 2 decades. And I think it's going to take strong regulation to bring it in. You actually have to have a real well-regulated system..” (12)</i>	35	18
Too much regulation for not enough gain	Miss-directed / inappropriate regulation. Regulation outweighing the potential on-ground gain. This acting as a deterrent for participation	<i>“I think putting stuff into legislation is pretty clunky, getting methods into legislation. We saw an awful lot of things that were perverse; things that went in that really didn't need to. For example, the Savannah fire method for 2018. It meant that there wasn't the capacity in government to take it back to legislate to change it. So we ended up with an unworkable method.” (14)</i>  <i>“There are some challenges and some complexities in the legislation that</i>	15	13

		<i>prevent that, because you also have to register the projects on the Regulator's website. You have to understand the financial implications of, getting these credits, and where they go, when to sell them, permanence periods. So even if you had the farmer write that land management strategy, there's too much complexity on the other side.” (20)</i>		
Education, extension, capacity development needs	Opportunities to improve markets/ participation/ compliance through education or extension. OR gaps that are identified to need addressing through these. Needs for improvements to the current extension/ education systems.	<i>“We definitely need, and we are seeing it, a lot of capacity building at the NRM level, which is really great. So I think we need to continue that education and capacity building, getting the stakeholders really aware of what they can do with these markets. I think the average farmer is increasingly recognizing that he's got another commodity on his shelf, and it's there for him to use. I think the banks and the insurance companies are all becoming highly aware of it. (14)”</i>	45	20
Environmental service market not a panacea	Not everything should be under the Ecosystem service hat. Somethings should just be done/ common practice OR these markets might not be the fix to all the problems.	<i>“And maybe it is stepping on toes. No one likes to tell someone a grazier who is going to dry up, ‘well, you should have prepared’. This was always going to happen, it's not a natural disaster, It's a normal climatic event. That's only going to happen more and more often.” (13)</i>  <i>“One thing that we always said from the early days is when you've got a hammer, everything looks like a nail. Like markets are not the answer to</i>	10	6



		<p><i>everything. It's really important to look at that market failure. Well do your market failure analysis to understand if a market is actually going to be the solution, because they are also not cost free. So being the good economist, you always have to weigh the benefits up against the cost of doing these things. Recognizing the extent of the problem, and then the cost of the solution, and making sure that you do your price based on what's there. But also, it's never working in a vacuum too. So things have gone before. Can you tailor on to things that have either already occurred or are occurring?" (5)</i></p>		
Expanding inclusions of ecosystem services	<p>Started with carbon markets, then came biodiversity, water + reef. Now people/ indigenous engagement and community, ESG (environmental Social Governance). The growing considerations and what should be paid for / rewarded.</p>	<p><i>"Once again, I think it's just a matter of capacity. And it's less immediate. I think we have probably fewer cultural ecosystem services associated with Australian culture in Australia. We have that history of not subsidizing like agriculture which is fine. Because we don't have that history of providing it, we just don't talk about it as much." (13)</i></p> <p><i>"We very much want to reward projects that are delivering, not just environmental benefits, but like economic benefits, employment benefits for people in regional areas... And as I said, First Nations people as well. So we're keen to look at how we can improve those socio and economic co-benefits, particularly in regional areas and ways that we can identify</i></p>	23	12

		<p><i>them and value them, and that people can provide assurance for them... .</i></p> <p><i>Into really wanting to make sure that these natural capital markets are bringing benefits to regional area.” (26)</i></p>		
Funding and financial support needs	<p>The cost associated with developing, maintaining and building these systems. OR the need for more money to further develop / aid in the systems betterment. Comments about who are the appropriate funding bodies. What money is needed.</p>	<p><i>“Government needs to be putting investment into that markets infrastructure, that enables all this to happen effectively.” (31)</i></p> <p><i>“... doing the initial thinking in another frame, about an emerging credit scheme to drag more dollars ... for investment over and above what the government is investing, because there's a shortfall between what government investment is able to deliver, verses what's needed in terms of system repair.” (12)</i></p>	34	20
Methods	<p>The need for more or improved methods. The need to re-visit or edit methods. The appropriateness of current methods – are they practical / applicable on-ground. The need for expanding methods to capture the nuanced differences in landscapes and how we can include those into credit</p>	<p><i>“It’s to help drive up take of these methods, but also inform the new method design and refinement to make them more fit for purpose.” (10)</i></p> <p><i>“But I think where a lot of them, not necessarily have gone wrong, but where we see issues in frameworks like ours underpinning markets, is that a lot of them are trying to measure or certify actions rather than outcomes and real impact on the environment.” (16)</i></p>	48	25

	generation.			
Additionality	Comments on how best to tackle the issue of additionality. What it is and what it means. What is the lost opportunity. Rewarding past poor behaviour. Not rewarding those who have been doing the right thing for a long time.	<p><i>“This is why the concept of additionality is really perverse in this circumstance. Especially with environmental markets, it’s the worst policy perversion. I’ve gone out to see farmers, again on the advanced end of the normal distribution of behaviours, and you get about halfway through the session, and you talk about additionality and they say, hang on! I’ve got 400 hectares of pristine bush that I fenced off 25 years ago, because of the right thing to do, and I’m passionate about and care about it. And they’re penalized for that good behaviour right. When, in fact, that’s the type of behaviour we need to be incentivizing.” (31)</i></p> <p><i>“... case in point. We’ve locked up land and have looked after it for 30 years. But nobody’s giving us a carbon credit, so very conscious of that.” (18)</i></p>	12	8
Modelling verse measurement and hybrid	Comments around the type of methods used. Are we better to measure everything? Pro’s (time saving/	<i>“That’s where the challenge is, where the complexity and cost come into it, because there’s labour to go out and do the measurement. There’s how you measure it, and there’s things that remove the automation that comes</i>	9	4

	accuracy) and cons (cost) of each. Suggestions of a combined way.	<i>from modelling. I would say we are in favour of a hybrid approach. You can't rely purely on modelling. But you can do some modelling as long as it's supplemented with some measurements. The reality is we don't have enough data across all the protocols to have great models just yet. So we're still going to have take the measurements and have a measured approach to build those models.” (20)</i>		
Rigour	This could be compliments on the rigour of current methods OR it could be the lack of rigour. Comments around how rigour is essential / the price that comes with high levels of rigour.	<i>“I think this is the challenge, that the schemes need to be underpinned by that public good intent as the primary driver. To then invest in the rigour, to give it the accountability.” (12)</i>  <i>“And I think that's where we haven't seen others being successful in actually underpinning those types of markets, because buyers want to have certainty that what they're buying is a real improvement and not just an action that isn't followed through with.” (16)</i>	19	11
Market maturity	How have ecosystem service markets changed over time. Mainly from the perspectives of interviewees. Only included insightful comments. This also includes narratives around personal experiences and what they think / have	<i>“Standing on the shoulders of giants right? We've got this 30 years of history of the mistakes that have been made, and how to not replicate those mistakes.” (31)</i>  <i>“But definitely, I think in perceptions. It went right off for the radar for 5-10 years, and now it's come back. So I think it's sort of gone in ebbs and flows</i>	39	22

	seen.	<p><i>quite a lot. And I think that actually hasn't helped participation because people think well, is this so going to be a long-term practice? Or is this going to come and go?" (11)</i></p> <p><i>"I think it's because we've got the flipping trend right at the very beginning, didn't we? We put in the Australia clause, and we said, hey, we want the land sector involved. whereas Europe was very much like No, this is all going to be about fuel switching. We don't want to go near trees and forest because they can burn down, there is too much uncertainty, and Australia took the opposite approach." (14)</i></p>		
Data	<p>How has / can the acquisition of data aid in the development of the market.</p> <p>The need for data to drive these markets. Need for data to make informed decisions about the landscape. Data needs for investment or compliance</p>	<p><i>"So it's nice for those rule to exist, but the Australian Government needs to be setting the position. But this is Australia's context, and this is our position. They need to acknowledge that context difference. Some interesting stories that came out of S.W. QLD, where a large buyer was going, looking at the deforestation rates in the postcode and saying, all right, we can't buy anything from that postcode, because there is deforestation in that post code? So that's a really blanket statement. We've really good producers getting smacked because of a general statement from someone looking at a map in Europe, and says oh deforestation</i></p>	46	19

		<p><i>happens in that postcode? So I think there's a really important role for government here in helping tell the story through standardized reporting.”</i></p> <p><i>(31)</i></p> <p><i>“I think at the policy level, they'll look back at 2030 and say we should have encouraged more measurements. regardless of entry projects and permeance periods, we should have just got every farmer out there, subsidize a whole bunch more measurements, because right now people get hung up on, well, I don't want to enter a 25 year contract and this contract. But the reality is, if we knew even 10 years ago, if you were a farmer and you knew 10 years ago, what carbon was. Then you started making some changes, and you took some measurements without being in a project. You'd build confidence in what you could do. But you'd also, if the initial measurements were done to standard, there's a lot of value in that data.”</i> (20)</p>		
Drivers of change	<p>What has been / is driving changes?</p> <p>Public perception or demand for ecosystem services driving changes in the market. Driving changes in</p>	<p><i>“We can see regulation coming here, or investors are actually demanding more environmentally friendly. Rather than make you do that in a project, let's buy an offset or let's buy it credit. It's a way of doing something that isn't necessarily actually changing your business model. And so I think a</i></p>	27	17

	industry. Creating expectations for the market to respond.	<i>lot of the financial players, they're actually investing in ecosystem services and assets. They are actually thinking of it as a portfolio, rather than does it actually fit in with a project. How do we use this to create our portfolio and access investors and business?" (17)</i>		
International market opportunities	The opportunity to access international markets (Australia being an export oriented country) and how this is driving changes to the Australian markets / methods / standards.	<p><i>"Because our value chain is not just domestic, we need to be looking at ways to share value across the supply chain internationally." (15)</i></p> <p><i>"We're going to get the software. And what we're trying to do now is lever for the DAF and the industry bodies that will enable us to lever into conversations with the global open source community. So that, just in Australia we talked about the PIC, the Lot and DP, and the location number based on longitude and latitude can often be different when you start to talk about import and exports. They're going to have their own peculiarities in the USA, And in Canada, and in the EU. So we've got to get those things to talk to one another. If we're going to have apples for apples, and the best way to do that without the Government picking corporate winners is to make it an open standard, and to open source it, and to make it inter-operable by design" (7)</i></p>	18	14
Progress	Barrier being the nature of politics.	<i>"But look at the dynamics of the policy in the space you're operating in.</i>	29	17

dictated by politics	Changes in a government can see changes to programs and funding.  How this has affected markets development	<p><i>You're subject to massive stroke of the hand reach." (31)</i></p> <p><i>"We don't have funding. Any successful scheme has to have consistent funding, and it has to be stable beyond the life of the electoral cycle. I think that's main reason, we haven't had anything stable. There are these little schemes that come in, and that they go for a few years and then they fade away again." (13)</i></p>		
Nature and Biodiversity markets	The development of biodiversity / nature market. How this has been tracking alongside the carbon market.  Comments on the current state of these markets or their needs.	<p><i>"Natural commodity market, anyway, let's put it that way. It's taken kind of twenty plus years for them to take shape, and there's still room for improvement, as I understand, in those markets. So it's probably naive to think that you can just design it and get it right the first time. It's going to take a bit of to-ing and fro-ing for us to get this right as well, I think certainly for complex things like biodiversity." (1)</i></p> <p><i>"Biodiversity is arguably more important than carbon. The two are intrinsically linked. The hard news, for those who are working in this area is we're going to have to do all this again for biodiversity. They're going to have to create a market for it. It's going to need to have to go through all methodology development failures and successes. It's going to have to be</i></p>	43	26



		<i>done, and it's going to have to be done quickly.” (10)</i>		
Perfection stifling progress	The balance between perfect science and getting progress on ground.	<i>“People from the cheap end of the scale will see how much they will make, And then you've got the other extreme, and I'll use the language green extreme other side, which says it must be perfect. From a policy position. I think we have to learn from the experience with the Greens in Parliament, with Rudd-Gillard Government, where they demanded the carbon price mechanism become a carbon tax for the first 3 years. And it costs us a decade. That was a very expensive choice, where perfect got in the way of good. I think that's the macro version of the 'policy versus quality' argument. We have to find a medium that we're happy to suffer the consequences of it not being perfect, with the view that we must iterate and improve in time.” (31)</i>	17	10
Sand pit and innovation	The need to innovation. The need to provide a space for testing out potentials. Rewarding innovation	<i>“I think we need to actually expand our industry and policy paradigms to incorporate that more entrepreneurial thinking. And actually look at alternative business models, not just science or policy.” (15)</i>  <i>“But there's a lot of rubbish out there at the moment. I don't even know how they get up. But I suppose you have to have a bit of a scatter gun approach to find a few of them that could work” (25)</i>	14	11

Technology	Comments around technology as an opportunity aiding in market development or access of markets.	<p><i>“A lot more satellite data. Let's start using our satellites and look at how we can incorporate that data. Let's bring down the transaction costs, and let's reduce the market friction.” (14)</i></p> <p><i>“The other thing that's making it easier, is just simple technology, in terms of the compliance and the measuring and the regulatory costs. As the machine gets better, metrics become more effective and all that stuff. It's just going to be much, much easier.” (17)</i></p>	18	12
Trust and Integrity	Overall comments to do with the trust needed in these systems for them to be viable. OR the lack of, which is making them a risky place to engage or is hampering engagement	<p><i>“That seems to be what's happening, it's making redundant, getting rid of some of the things that might be overly complex, and don't have much effect. Like putting more trust in people, but putting more trust in systems as well, and there's probably a need for more technologies to resolve some of these things.” (20)</i></p> <p><i>“And bear in mind not everyone's a good corporate citizen with the best intentions. There's going to be all different sorts of motivations.” (21)</i></p>	14	12
Appropriate role of actors	Who are the right actors in place for the job and do they hinder uptake or trust? This code is to do with TRUST /	<p><i>“I'm not sure where it would best, but somebody who is an independent of kind of the broker and somebody that they could actually go to and say, how does this work, and have that kind of free conversation? I think</i></p>	60	23

	perception.	<p><i>actually would be a good starting point and that it wasn't then necessarily that they could actually approach that person instead of at the moment it's brokers, or people who have a vested interest in it, other than ones that are really trying to push it. But if they had sort of somebody that was independent of all of the process, but could kind of give them an overview of how it all works" (11)</i></p> <p><i>"So we know that people like having a trusted point of contact. So they're providing that. It's not farmed out to a third party who does a little bit, and then another person does a little bit, and then this person, this officer straight at the University is doing this bit." (13)</i></p>		
Carbon service providers	Comments around the emergence of CSPs or those intermediaries. Issues / stories surrounding them. Lack of Quality assurance. The importance of this intermediaries role, BUT is it in its best form? How could it look?	<p><i>"The catch is really to find a role that's appropriate for those intermediaries, so that they don't dominate the markets. Complexity definitely creates an atmosphere and opportunity for kind of more power than they should have, I think." (1)</i></p> <p><i>"But the middlemen are too powerful, so we'd like to see what we call dis-intermediation. Get rid of the middle man. We'd like to see carbon projects that people can do on their own, with the help of their NRM</i></p>	38	21

		<p><i>Representative.” (14)</i></p> <p><i>“Another issue that gets discussed a lot is that the market's making carbon service providers rich, and the landholders are missing out. That's a really tough one. And look, I agree with getting more value for the actual landholders. This is linked to integrity. We're also dealing in a really technical and complex area.” (26)</i></p>		
Collaboration and discussion	comments surrounding the need for different stakeholders to collaborate or discuss	<p><i>“ And I also think that the recent change back to doing collaborative methods is a sensible thing, because the Government can't pretend to have the logistical and practical knowledge of how things work on the ground.” (18)</i></p> <p><i>“And I also think that the recent change back to doing collaborative methods is a sensible thing, because the Government can't pretend to have the logistical and practical knowledge of how things work on the ground.” (21)</i></p>	17	9
Data visibility	The need for data/ examples to provide trust in the system / not being able to access data. What has been done	<i>“And what we found is that some States have these types of data, they're just not publicly available, or the people in the departments don't even know they exist. Which makes it really hard for landholders, because we</i>	19	12

	<p>where? Why can't we access it? How do we know things working ?</p>	<p><i>just certifying the environmental accounts, we don't actually build them for people, so we can't go out and actually do all of that work for them, and that's a big barrier to entry for a lot of landholders.” (16)</i></p> <p><i>“... legislation protects data. You're not allowed to publish it. So the carbon estimation areas, it's unlawful for us to share that with anybody under the legislation. If it's an Australian carbon credit unit someone like Macintosh or anyone else, a conservation group or a farmer group wants to have a look at it, and they can't actually see it, well, they're not going to have any trust in them. So transparency is really fundamental part of trust. I think trust is the real word that you've got to have in all of this and that just means everybody saying if you can't see it, you're not going to trust it. Those 2 things, having the correlation that is scientifically rigorous and people being able to see that, seeing the actual numbers and check them for themselves.” (24)</i></p>		
<p>Perception influencing integrity</p>	<p>How reputations or previous history or potential actors have influenced the how markets or programs are perceived.</p>	<p><i>“That's the T, in TLC. So to the data availability, data visibility in being able to tell our story. That's super critical. ... marketing agency, and they're ag focused, ... they are saying, everyone in ag sector reckon carbon's bullshit and it's too much smoke 'n mirrors. It's just all noise. ...</i></p>	<p>41</p>	<p>24</p>

		<p><i>your job as an organization is the chief explainer, backed by statements about reality, not trying to sell the product, not trying to push an agenda. It's just being the chief explainer. Because government is not doing it. Supply chains aren't doing it. Supply chains just screaming, it's coming. But no one's actually getting in there, and demystifying it, clearing the smoke out of the room and saying, with those case studies, this is all you need to be doing right now.” (31)</i></p>		
Transparency	<p>Comments to do with transparency as a need. Over lack of transparency of the system to all players. To the farmers, to the stakeholders and to the public. And what are the ramifications of this lack of transparency</p>	<p><i>“But I also think transparency from the LRF would be very beneficial. And maybe a system where not every landholder has their individual contract with the LRF, and all the prices are hidden. But that there's more so a market mechanism behind how those credits are actually paid for?” (16)</i></p> <p><i>“So I sort of see the failings of markets trying to just have everybody get going as a project developer, and the lack of standardization of contracts. And the information asymmetry between farmers and these project developers, and lack of transparency, and all those kind of things. You sort of go, can a government make it easier for everybody to break down those barriers as well?” (22)</i></p>	23	13
Examples	<p>The need for examples; What does a</p>	<p><i>“When, in fact, that's the type of behaviour we need to be incentivizing. So</i></p>	13	10

	<p>good function system / farm / project / application look like?</p>	<p><i>there has to be a fast start component to the concept, where you give them a leg up, and you show everyone, what's the phrase; You can't be what you don't see. If we don't have any examples of this stuff, then no one can follow.” (31)</i></p> <p><i>“So I sort of see the failings of markets trying to just have everybody get going as a project developer, and the lack of standardization of contracts. And the information asymmetry between farmers and these project developers, and lack of transparency, and all those kind of things. You sort of go, can a government make it easier for everybody to break down those barriers as well?” (11)</i></p>		
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