energetics

Unlocking value for the Queensland economy with land and agriculture offsets

Department of Environment and Heritage Protection
Queensland Government

15 September 2017 | 124524

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Document control

Description	Prepared by	Reviewed by	Approved by	Approval date
Draft	Sally Cook Olivia Kember	Peter Holt	Peter Holt	23 August 2017
Draft	Sally Cook	Peter Holt Helen Wetherell	Peter Holt	11 September 2017
Final	Sally Cook	Peter Holt Helen Wetherell	Peter Holt	15 September 2017

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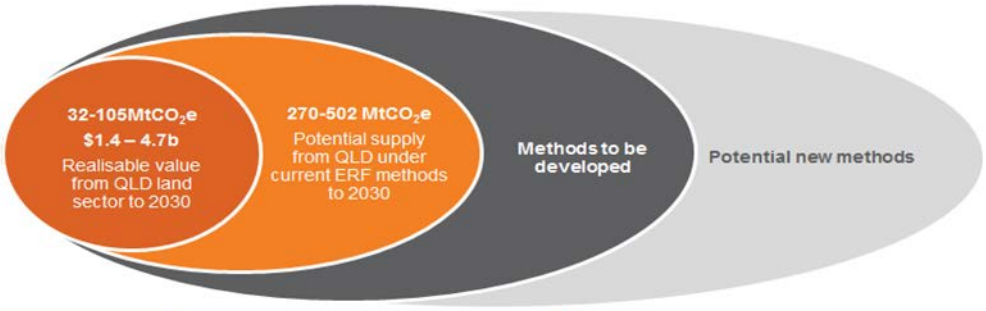
Executive summary

Offsets have an important role to play for nations working to meet their commitments under the Paris Climate Agreement to limit global warming to well below two degrees Celsius**.** Filling the gap between emissions, required decarbonisation and other abatement opportunities, offsets effectively buy time for step change initiatives to become viable and cost effective. In the longer term they can be used by sectors such as aviation, which will have a limited ability to decarbonise.

Queensland has an opportunity to participate in developing carbon markets as a supplier of offsets supported by robust verification methods. Aside from the significant direct financial value to the State's economy from the sale of offsets, the activities associated with offset creation deliver a range of co-benefits, particularly to the health of the environment through improvements to biodiversity and water quality, landscape protection, income for Indigenous communities and productivity enhancements to agriculture.

This report describes the potential economic value to the Queensland economy of carbon offsets from the land sector[1], the barriers that need to be overcome and the support that needs to be achieved across government departments. The diagram below describes the value that can develop over time.



Realisable abatement	Current ERF methods	Methods to be developed	Potential new methods
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Figure 1: Value of land sector offsets to Queensland

[1] For this report, references to 'the land sector' cover activities such as vegetation, pasture and herd management, and savanna burning, but does not include waste management activities.

Queensland can generate between $1.4 to $4.7 billion from land and agriculture offsets

This estimate for the period 2017 to 2030 is conservative and assumes low demand in the short term, primarily due to policy uncertainty and the lead time anticipated for strengthening the Safeguard Mechanism[2].

It is worth noting that the analysis conducted for this report also shows that domestic demand for land sector offsets could be much higher than forecast. If demand for land sector offsets increases, a further 270 - 502 million tonnes of abatement ($MtCO_2$-e) are possible. This could be worth up to $8 billion to the Queensland economy. However, a combination of the following would need to occur:

- under-delivery of abatement by other sectors in the economy
- increased voluntary demand for offsets
- a strengthening of Safeguard Mechanism baselines
- an increase in Australia's business as usual emissions.

Regrowth of native forests can accommodate offset generation

The majority of offsets created would come from a number of existing methods under the ERF, with a larger contribution expected from regrowth methods including:

- human induced regeneration of a permanent even-aged native forest
- native forest managed regrowth
- avoided clearing of native regrowth.

As an example, delivering 32-105 Mt CO_2-e by 2030 would require 2.2 – 9.2 million hectares (Mha) of regenerating forest[3]. However, should additional abatement be achieved from agricultural and other methods, such as savanna burning or environmental planting, the regrowth required would be reduced.

Significant additional benefits can be obtained

The valuation of co-benefits is also critical to expanding participation in carbon markets. Recognising the significant co-benefits to biodiversity, landscape protection, water quality, and financial benefit to indigenous communities that are created by land sector projects (beyond their direct economic benefits as emissions offsets) will be critical to the long term viability and attractiveness of Queensland's carbon market to domestic and international investors.

To realise the economic potential, a co-ordinated whole of government and industry approach is required

A variety of threats to realising this economic potential includes inadequate information for stakeholders, high transaction costs and conflicting intra-government approaches. Significant longer-term risks that require near-term and sustained attention include technical limits on market growth, increasing complexity and uncertain climate policy.

[2] The Safeguard Mechanism is the compliance scheme which requires large emitters to purchase offsets when they exceed their emissions baseline. Only Australian Carbon Credit Units can be surrendered for compliance purposes (international offsets cannot be used).

[3] Analysis based on incremental implementation between 2018 to 2030. Smaller areas would be needed if regrowth commenced immediately.

To address these issues, this report provides a series of recommendations for the Queensland Government. These are outlined below:

Measures to address near term issues: 2017-2020

- Advocate for domestic policy certainty to stimulate demand for offsets
- Provide relevant and targeted information to encourage market participation
- Enhance business and financial models available in the market
- Reduce and streamline participation and transaction costs

Measures to address longer-term issues: 2020-2030

- Maintain an active engagement in domestic and international climate policy developments
- Create new methodologies and offset activities to increase market size
- Value co-benefits and develop best practice policy and regulatory frameworks to support a co-benefits market in Queensland
- Encourage support social licence for the offset industry
- Continue to implement strong policies to mitigate the physical impacts of climate change

By incorporating ecosystem services into policy and economic considerations, significant value will be unlocked for Queensland.

1. The role of offsets in meeting global emissions targets

Nations across the world have committed under the Paris Agreement to limit warming to 2°C and pursue efforts to further contain warming to 1.5°C. If this is to be achieved it will require abatement of considerable magnitude and speed. However, pledges set to date under the Paris Agreement are insufficient to set the globe on the trajectory to meet the 2°C aim, and are vastly short of what is required to meet the 1.5°C objective. Climate Action Tracker also estimates that based on current policies, countries will fall short of their current Paris targets by 2,000-8,000 million tonnes of carbon dioxide equivalent ($MtCO_2e$) in 2030[4]. To meet the 2°C aim, significant changes in countries' climate and energy policies as well as a strengthening in Paris Agreement targets will be inevitable.

Many studies also show that pursuing decarbonisation is in the best economic interest of nations. The Centre for Climate Change Economics and Policy finds that "the majority of the emissions reductions needed to decarbonise the global economy can be achieved in ways that are nationally net-beneficial to countries, even leaving aside the climate benefits"[5].

Offsets have an important role to play. In the short term, they can fill the gap between emissions, required decarbonisation and other abatement opportunities, effectively buying time for step change initiatives to become viable and cost effective. In the longer term they will play an important role to offset emissions from sectors, such as aviation, which will have a limited ability to decarbonise. The aviation sector will commence a voluntary scheme from 2021 (the Carbon Offsetting and Reduction Scheme of International Aviation (CORSIA)) which will require participants to offset emissions from passenger transport when they exceed 2020 levels; effectively capping emissions from the sector[6]. This initiative will drive demand for carbon offsets. A similar approach could be developed by other industries such as the maritime sector.

Significant international policy changes are also pending which could influence the economic value of Australia's offset market. This includes the progression of Article 6 of the Paris Agreement. Once rules are finalised, this Article will support the international trade of carbon units (referred to as internationally transferred mitigation outcomes (ITMOs)) between parties. Importantly, unlike the Kyoto Protocol, Article 6 does not restrict trade to certain types of approved units. Instead it is likely that the units traded will need to meet common standards and accounting practices, but will be able to be created in a number of international markets.

A number of outcomes are possible:

- the trade of carbon units takes place through a direct bilateral agreement between two countries, permitting abatement in one country to be transferred to another country
- the establishment of 'carbon market clubs'[7] where linkages are formed by a multilateral agreement between participating countries to trade offsets at an international level

4 Climate Action Tracker http://climateactiontracker.org/global/173/CAT-Emissions-Gaps.html accessed 7 July 2017
5 Nationally self-interested climate change mitigation: a unified conceptual framework, Fergus Green, Centre for Climate Change Economics and Policy and Grantham Research Institute on Climate Change and the Environment, July 2015
6 IATA, http://www.iata.org/policy/environment/Pages/corsia.aspx, accessed 5 September 2017
7 Centre for European Policy Studies, "Carbon Market Provisions in the Paris Agreement (Article 6)". Also see more information on carbon market clubs in the Global carbon offsets market analysis prepared by Energetics for the Department of Environment and Heritage Protection.

- the establishment of an international offset trading framework overseen by the Conference of the Parties (COP) which is accessible on a voluntary basis to all parties to the Paris Agreement (Article 6)
- the use of non-market approaches for abatement, the form of which is uncertain and has not been well articulated to date.

These new markets have the potential to increase demand for carbon offsets from Queensland. However, as the rules for international trade under the Paris Agreement are still developing, there are risks to the form, timing and extent of international demand. The Australian Government has an important role to play in the development of international rules to ensure they are robust and offsets are genuine.

2. The role of offsets in domestic markets

Under the Paris Agreement, Australia has committed to reduce emissions by 26-28% on 2005 levels by 2030. Energetics' previous analysis for the Department of the Environment and Energy[8] shows that this target is achievable, as long as the existing government policies are structured to provide sufficient incentives and/or compliance drivers for decarbonisation.

Australia's domestic policy includes:

- the Emissions Reduction Fund (ERF) established by the Australian Government to purchase abatement (Australian Carbon Credit Units (ACCUs)) from eligible offset projects
- the Safeguard Mechanism which requires entities exceeding their emissions baseline to purchase ACCUs, effectively capping their emissions over time.

The intent of the ERF policy is to purchase low-cost abatement for the domestic economy and to motivate investment in decarbonisation projects which wouldn't otherwise occur. The Australian Government allocated $2.55 billion to the ERF, of which Queensland has been an active participant and significant beneficiary. However, only $300 million in funding remains. Based on previous auction volumes, this may be exhausted within the next one to two auctions. No additional funding has been allocated[9].

The Safeguard Mechanism provides the compliance driver by requiring large emitters to purchase offsets when they exceed their emissions baseline, effectively capping their emissions over time. However, the baselines are very generous and are unlikely to be exceeded in the near term by the majority of entities. For those entities that do exceed their baseline, legislative concessions are available to smooth the exceedance over a three year period. Without lower baselines there will be little compliance demand for offsets in the near term. Participants recognise that baselines will need to strengthen over time but the extent, timing, and impact on each industry has not yet been clarified by the Australian Government.

Unless further funding is allocated, the ERF is likely to be depleted before the Safeguard Mechanism is strengthened. If this occurs, the ACCU market could stagnate resulting in a

8 http://www.environment.gov.au/climate-change/publications/modelling-and-analysis-australias-abatement-opportunities
9 http://www.afr.com/news/politics/no-topup-for-the-emissions-reduction-fund-in-may-budget-20170417-gvm4c3

reduction in both the demand for offsets and their price. In the absence of decisive policy signals to underpin demand and supply, a swift domestic policy change could result in insufficient supply of ACCUs and higher prices, particularly if safeguard baselines need to be tightened deeply and quickly.

In this policy environment, low domestic demand for ACCUs is expected (beyond what is already committed under the ERF) until after 2020. In the following decade (2020-2030) we assume that:

- decarbonisation of the electricity grid continues to play an important role in reducing domestic emissions
- the Australian Government shifts some or all of the burden of meeting its Paris Agreement target to large emitters by tightening Safeguard Mechanism baselines, increasing the demand for ACCUs for compliance
- the Australian Government purchases offsets to meet any gap between Australia's actual emissions and our Paris Agreement target.

3. Value of land offsets to Queensland

ACCUs can be traded domestically either with Australian Government (via the ERF) or 'over the counter' on the secondary market. Demand in the secondary market is driven by:

- entities exceeding their Safeguard Mechanism baselines
- companies, state governments or local governments purchasing offsets for voluntary requirements, such as to meet emissions targets
- parties with ERF contracts and projects that fail to achieve their contracted abatement levels.

Section 2 outlines a number of reasons why demand in the secondary market is anticipated to be low, particularly in the short term. Due to policy uncertainty, and a history of erratic climate and energy policies in Australia, we have assumed that the market for offsets establishes fairly slowly. With a change in Government, it is possible that a new market-based mechanism may be developed or, if the current policy is retained, strengthening of the Safeguard Mechanism would happen incrementally. In both instances a transition period is expected to allow businesses time to adjust and hedge against the increased financial burden. We also anticipate that most industries will resist a strengthening in compliance obligations or will seek to reduce the burden that they will carry. For these reasons the demand for domestic offsets has been assumed to be fairly low until the early 2020s, providing a conservative estimate of domestic offset demand.

If policy moves more quickly, and particularly if baselines strengthen substantially with little lead time, then the demand for offsets could be much higher.

There is also potential for offset markets to open up to international trade in the future. Therefore, in addition to a domestic scenario we have considered the value to Queensland under constrained international trade and open global trade. In these scenarios we have made assumptions about the extent and timing of international linkage, the proportion of demand for offsets from Australia, and Australia's demand for international offsets (see Appendix A for more details).

Given that the rules of the Paris Agreement are still being established, we assume that international trade is not widely taken up until the mid-2020s and that most countries delay

purchasing offsets until the later part of that decade in the lead up to many countries' Paris Agreement target dates. As a result, the value realised by the Australian offsets market is expected to be influenced by:

- the speed at which Paris Agreement rules are established, agreements are formed, and trading is widely adopted (particularly Article 6)
- the demand for Australian offsets from international countries
- Australia's participation in regional 'carbon clubs'
- Australia's demand for international offsets.

The following sections outline the value realised by Queensland from ERF contracts, and the potential value which could be created in the three scenarios: domestic trade, constrained international trade and open global trade.

In assessing the potential of the supply of Queensland land sector offsets we have made the following conservative assumptions in all three scenarios:

- **carbon price:** the forecast carbon price is the value needed to make the supply of abatement from the domestic economy equal to the abatement demand. This means that only projects which are economic at the forecast carbon price are assumed to be implemented. These projects may be from the land and other sectors.

- **when there is excess abatement at a given price we assume the full potential of the land sector is not realised.** This reflects the fact that growth of the land sector offsets market will likely face constraints from market barriers discussed below. It also prevents land sector offsets flooding the market and depressing the modelled carbon price.

- **Queensland maintains its current share of land projects:** We assume that the proportion of land offsets from Queensland is equal to the state's share of land offsets in the ERF to date.

3.1. Value realised through ERF contracts

Queensland has been a significant beneficiary of the ERF. The state has secured almost 20% of the ACCUs contracted through the ERF. Of land sector projects, Queensland has contributed 29% of savannah burning projects, 28% of agriculture projects and 16% of vegetation projects. Based on weighted average auction prices, projects from these sectors are expected to contribute $840m to Queensland over the next decade.

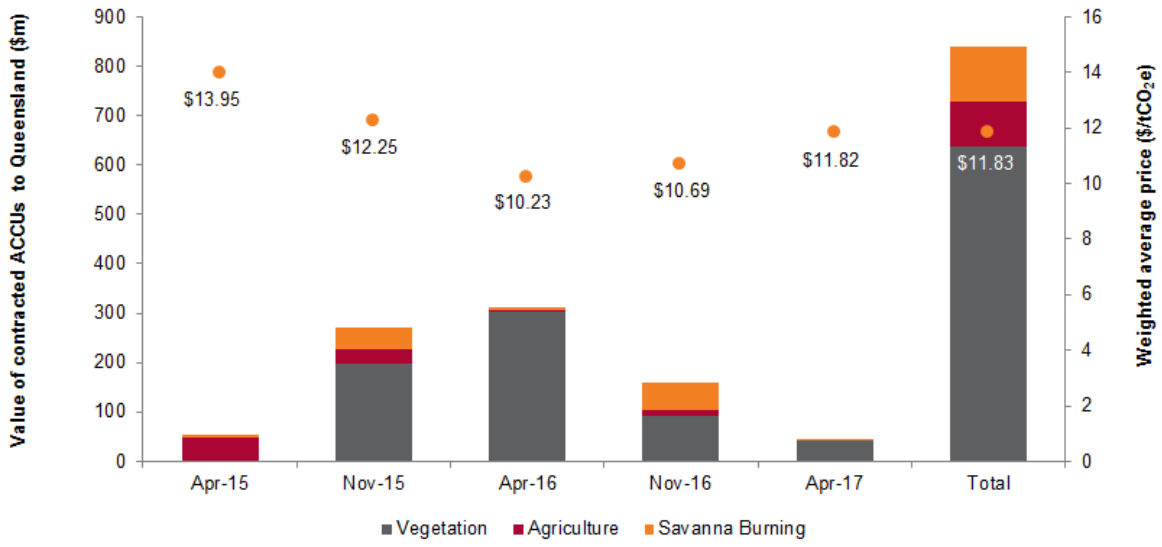

Figure 2: Estimated value of contracted LULUCF ACCUs to Queensland based on weighted average auction prices

3.2. Potential future value

Our analysis finds that $1.4 to $4.7 billion could be realised from land sector offsets in Queensland in the period to 2030, based on the scenarios presented in Figure 4. This total comprises $0.6bn to $3.8bn of value in addition to the $0.8bn already realised through the ERF. If sufficient demand was available, we estimate a further 270 - 502MtCO_2e of abatement could be economic at the modelled carbon prices and supplied by Queensland's land sector projects under current ERF methods, as shown in Figure 3. This could be worth up to $8bn if demand increases. However, for this to materialise a combination of the following would need to occur:

- under-delivery of abatement by other sectors in the economy
- increased voluntary demand for offsets
- a strengthening of Safeguard Mechanism baselines
- an increase in Australia's business as usual emissions.

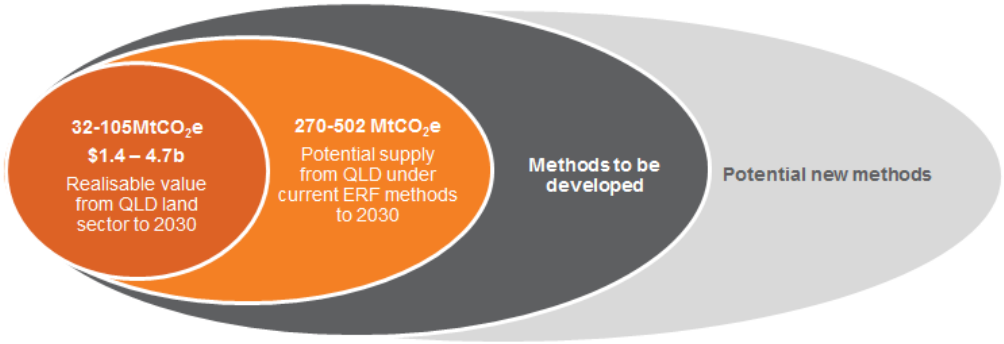

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Figure 3: Potential value from Queensland land sector offsets to 2030

Domestic

Efforts to pursue international trading are hampered by political and/or practical barriers which result in Australia having no linkages to trading partners. We assume that Australia meets its committed Paris Agreement target, either through the purchase of offsets by the Australian Government or by the tightening of the Safeguard Mechanism to shift this burden to large emitters. We assume that international credits are not accepted in the Safeguard Mechanism and that Australia does not purchase any international offsets to meet its emissions reduction target.

Multilateral linkage

The Paris Agreement, once rules are formalised, will allow bilateral and multilateral agreements to be established between countries for offset trade. This scenario assumes that Australia has established links with a number of its key trading partners for offset trade but these are fragmented and a truly global scheme has not been established. Demand is driven by Australia's Paris Agreement target and the projected shortfalls on the Paris Agreement targets of our linked trading partners. A threshold for international trade is applied to represent countries' preference to favour domestic abatement action (either through strengthening compliance requirements or offsetting) over the purchase of international offsets. Trade is ad-hoc and 'over the counter' and there is no price parity. Countries are assumed to purchase international units up to the assumed threshold when prices of their trading partners are significantly cheaper than their domestic price.

Global harmony

In addition to bilateral and multilateral trade, the Paris Agreement rules allow for the establishment of international offset trading between all parties to the Agreement. This scenario assumes international trading is established in the next five years and that ACCUs can be surrendered for the equivalent internationally traded unit. Trading volume is dictated by the forecast global shortfall on countries' Paris Agreement targets. For simplicity we apply an assumed percentage of units purchased from Australian markets. We assume that Australia purchases international units if they are significantly cheaper than the cost of offsetting domestically.

Figure 4: Overview of scenarios

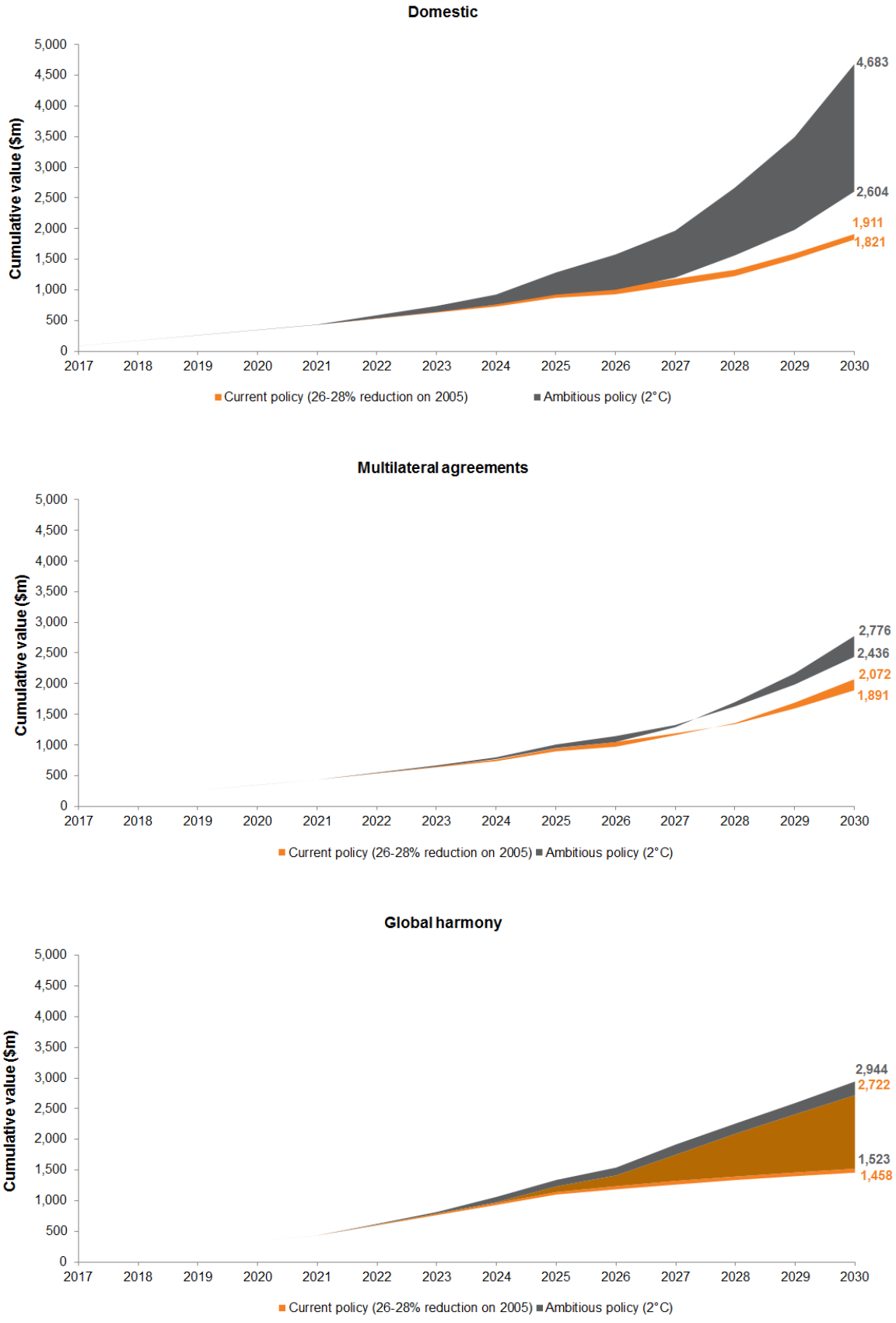

Figure 5: Cumulative value of land offsets to the Queensland economy ($m) under each scenario based on Australia's current Paris Agreement target (in orange) and an ambitious target aligned to the 2°C objective (in grey)

Over the period to 2030, the domestic scenario provides the highest potential return to Queensland (Figure 5) but only if Australia sets a more ambitious target aligned to the 2°C trajectory. This reflects the fact that if Australia's target is strengthened in a short timeframe, a higher price will be needed to make additional abatement projects from industry economic. If barriers identified in this report are overcome (see section 5), this also presents an opportunity for the land sector to capture a larger share of the market due to the sector's ability to supply offsets at lower cost.

In the absence of a stronger domestic target, the global and multilateral scenarios result in higher economic value to Queensland due to an assumed increase in demand for Australian offsets from international markets. Based on the assumptions used, this increased demand compensates for the lower offset prices estimated in the two international scenarios.

The multilateral agreements scenario has a relatively small range in total value due to the assumptions which were made about which countries Australia may link with and when this may occur. We assumed that Australia was most likely to link with our key trading partners, particularly those who are already discussing linking (Japan, Korea, and China) and those which are forecast to have significant shortfalls relative to their abatement target. Unlike the domestic scenario, the ability for limited international trade keeps the price lower towards the end of the period.

The global harmony scenario could see wider variability in price and demand. We assume that a proportion of the global shortfall against Paris Agreement targets is sought from the Australian offset market and that prices converge as trading becomes established. This scenario has the lowest modelled carbon price in 2030.

In the two international scenarios, projected benefits may also be conservatively low, because they assume that other countries' targets do not tighten to align with the 2°C trajectory and international carbon policy remains constant.

Appendix A provides more information on the method and assumptions.

4. Realising abatement from Queensland's land sector

Projects from Queensland's land sector have committed to deliver 120.5MtCO_2e of abatement under current ERF contracts[10]. Of these projects, human-induced regeneration of native forest[11] has provided the majority of the emissions reductions. These projects enable land holders to earn carbon credits by stopping the suppression of native vegetation, allowing native forest to regenerate.

10 ANREU accessed 17 August 2017 http://www.cleanenergyregulator.gov.au/ERF/project-and-contracts-registers/carbon-abatement-contract-register
11 Human induced regeneration of a permanent even-aged native forest

These projects appear to be viable at a weighted average price ($11.05) that is lower than the average received through the ERF to date ($11.83)[12]. Assuming sufficient supply, there is the potential for projects to continue to be a cost effective source of abatement to 2030.

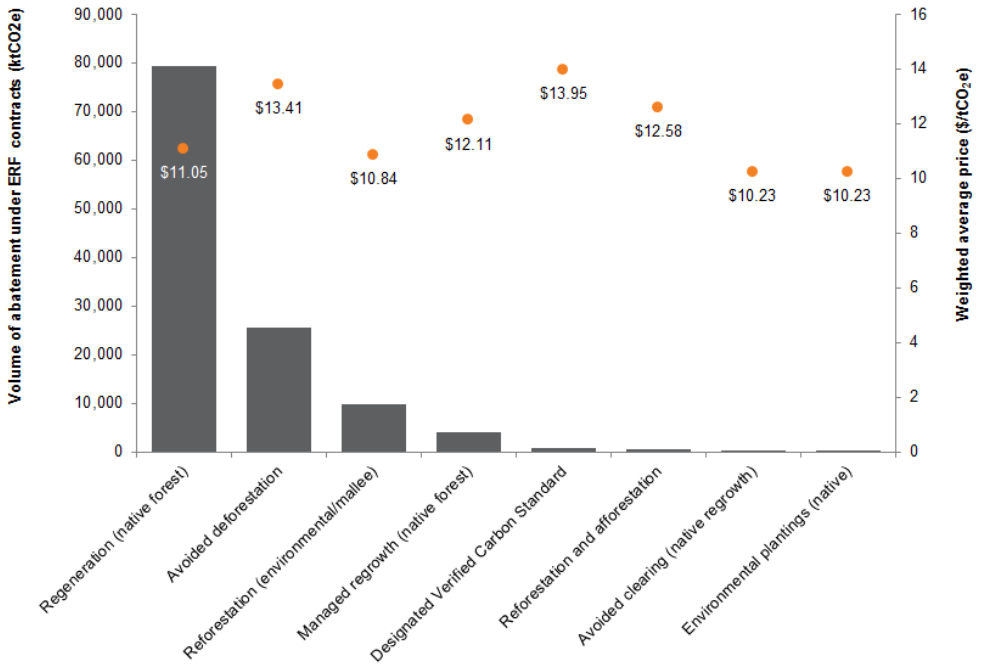

Figure 6: Volume of land sector ACCUs by method with weighted average price

Modelling by the Department of Science, Information Technology and Innovation (DSITI) has also found that regrowth methods[13] can deliver abatement which is viable at low carbon prices. At a carbon price of $20/t$CO_2$e native forest regrowth projects have the potential to deliver a maximum of 106MtCO_2e of abatement versus 3.8MtCO_2e which could be provided by environmental plantings[14].

Maps developed by DSITI for this project (Figure 7) show that if the land sector abatement potential in our analysis (32-105 MtCO_2e) was delivered purely through regrowth projects, this would require 2.2 – 9.2 million hectares (Mha) of regenerating forest[15]. For context, the area of cleared land used for extensive grazing in Queensland is 28 Mha.

The maps below display those regions (in black) where regenerating forest projects are likely to be most economic and lie within 100m of existing woody non-remnant vegetation. This draws upon DSITI's previous modelling results[11]. The mapped area assumes incremental implementation of regrowth projects between 2018 and 2030 to achieve the forecast abatement demand of 32 – 105 MtCO_2e. This includes significant areas of regrowth that would be young and yielding relatively low rates of abatement in 2030. The lag between establishment and maximum regrowth also means

12 ERF carbon abatement contract register http://www.cleanenergyregulator.gov.au/ERF/project-and-contracts-registers/carbon-abatement-contract-register and weighted prices in each auction http://www.cleanenergyregulator.gov.au/ERF/Auctions-results/april-2017
13 Human induced regeneration of a permanent even-aged native forest, native forest managed regrowth, and avoided clearing of native regrowth methods
14 Butler, D.W. and Halford, J.J. 2015 Opportunities for greenhouse benefits from land use change in Queensland. Department of Science, Information Technology and Innovation, Brisbane
15 Analysis based on incremental implementation between 2018 to 2030. Smaller areas would be needed if regrowth commenced immediately.

that projects sufficient to sequester 32 – 105 $MtCO_2e$ by 2030 could achieve higher levels of emissions abatement in the following decade, estimated at 124 – 460 $MtCO_2e$ by 2040.

More rapid project establishment or additional abatement from agricultural and other methods, such as savanna burning or environmental planting, would reduce the extent of regrowth required to deliver 32 – 105 $MtCO_2e$ by 2030.

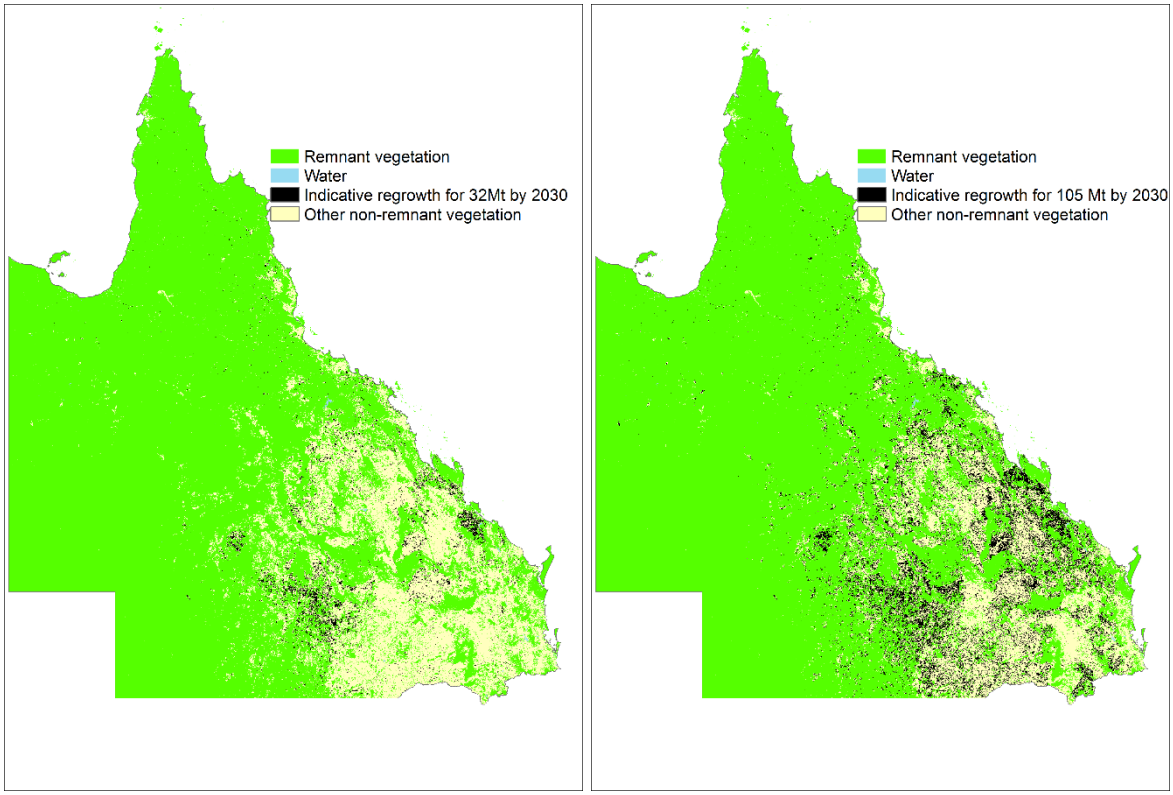

Figure 7: Indicative extent of native forest regrowth that would be required to meet the low and high range abatement projections to 2030 without inputs from additional methods

Our analysis for Department of the Environment and Energy[16] also found a number of agriculture methods which have the potential to be viable at low carbon prices. These include methods which encourage better management of pastures and therefore higher emissions sequestration in soils, and advanced farming methods such as changing livestock feed. However, these methods have seen a lower uptake in the ERF (11% of the abatement delivered from Queensland's land sector projects is from agriculture methods). This is potentially due to the smaller scale and higher barriers to uptake for these projects as discussed below. Additional abatement from agricultural and other methods, such as savanna burning or environmental planting, would reduce the extent of regrowth required to deliver 32 – 105 $MtCO_2$-e by 2030.

Queensland introduced the *Vegetation Management Act 1999* (VMA) to control land clearing. The VMA establishes the framework for managing vegetation on freehold and leasehold land and determines what vegetation can be cleared, where and for what purpose. The VMA was

16 http://www.environment.gov.au/climate-change/publications/modelling-and-analysis-australias-abatement-opportunities

strengthened over time and by 2009-10, land clearing had dropped from over 700,000 hectares when the legislation was introduced to just over 83,000 hectares[17].

Since 2011-12, rates of clearing have increased. In 2013, changes were made to the VMA which relaxed the controls on vegetation clearing in Queensland. Increased land clearing has the potential to widen the gap between Australia's actual emissions and target, thereby increasing the need for carbon offsets.

A decrease in the rate of clearing will have carbon and environmental co-benefits and lower emissions from the business-as-usual case for Australia. The creation of carbon offsets enables landholders to access additional revenue if they choose. By broadening potential revenue generation, landholders can manage their activities on their properties in the most appropriate manner.

Any reduction in land clearing will further increase carbon market potential, either domestically and/or internationally as discussed in section 3.2. Further consideration could be given to developing methods or complementary schemes recognising co-benefits under which emissions abatement from avoided clearing could be incentivised.

5. Developing the offsets market

While some of the land sector methods are mature and have been in use for many years, the market as a whole is on the cusp of growth. Barriers to offset provision and developing a robust offsets market can be broadly distinguished between those that present immediate restrictions on the market, and those that carry longer term risks.

5.1. Near term issues: 2017-2020

- lack of Australian Government policy certainty to stimulate demand
- additional information needed to encourage market participation
- limited business and financial models to access a broader market participation
- high transaction and participation costs particularly for smaller projects

5.1.1. Lack of domestic policy certainty to stimulate demand

The ERF, which provides Australian Government funding to purchase offsets, is expected to be exhausted within the next year and no additional funding has been committed. This is likely to occur before the Safeguard Mechanism is strengthened to increase demand in the compliance market.

Without certainty in climate policy, the financial incentives to undertake new offset projects in the near term will be limited. The outcomes of the Australian Government's review of climate policies may provide guidance on the Safeguard Mechanism in late 2017. However it could be longer before clarity is given on the timing, extent and industries impacted. A change in government might

17 Department of Science, Information Technology and Innovation, 2016, Land cover change in Queensland 2014-15: Statewide landcover and trees study report, Queensland Government https://publications.qld.gov.au/dataset/98622954-d0d9-49c0-b3f5-044af7858ca2/resource/872e9c96-b40b-45ae-95dc-1f040efac5c1/download/slats-report-2014-15.pdf

see the creation of a new policy, such as the evolution of the existing policies into a baseline and credit trading scheme. Until clarity is provided, it is unlikely that businesses will invest in offsets as a financial hedge for their potential compliance liability under the Safeguard Mechanism.

In the interim, demand is expected to be low and likely to be limited to businesses and cities voluntarily purchasing offsets for carbon neutrality or to achieve low emissions targets. Considering the significant economic potential with $1.4 to $4.7 billion that could be realised from land sector offsets in Queensland (refer to Section 3.2), the Queensland Government has an opportunity to increase demand and provide some certainty for the local carbon offset market.

Recommendations

The Queensland Government should maintain discussions with the Australian Government on:

- the need for clear guidance on the timing of policy decisions regarding the Safeguard Mechanism to provide the market and industry with certainty on likely impacts
- the allocation of new funding to the ERF to prevent short-term market collapse
- involving the states in discussions on Australia's approach to international carbon market development and Article 6 to maximise potential for Queensland carbon offsets.

The Queensland Government to:

- develop a policy framework to prepare the Queensland economy to realise potential revenue stream from expected domestic and international demand
- provide additional funding for carbon offsets that create additional, and strategically valuable environmental or social co-benefits for Queensland such as in Great Barrier Reef catchments or Indigenous carbon farming projects (refer to section 5.2)
- investigate additional demand for carbon offsets such as Queensland Government offsetting travel emissions with locally sourced offsets
- consider policy responses to address other identified barriers, so that Queensland offset providers are well-positioned to capture value from improvements in the national climate policy environment.

5.1.2. Information needed to encourage market participation

There are pervasive information barriers across most aspects of the existing carbon offsets market. While data and tools exist for many of the land sector methods, there is limited information on the full range of benefits, costs, opportunities and risks of participation. Interactions required between landholders, aggregators, auditors, and government can also be complex and confusing.

Navigating this complexity also requires significant trust to be established between participants and third party aggregators or advisors. Existing relationships for example with suppliers, other landholders, respected community representatives and industry bodies, may assist to disseminate information and establish trust. A voluntary Code of Conduct is being developed by the Carbon Market Institute's Carbon Project Developers Council which will articulate common standards for providers of aggregation and similar services. This will be important for providing greater market confidence for potential participants when dealing with aggregators.

Banks and financiers also have difficulty valuing the risks and benefits of offset projects. Projects contracted under the ERF have in some instances been recognised as a liability due to the risk

that the project may not be able to supply the contracted ACCUs in full. When these projects are not correctly valued there are adverse impacts on landholders, inhibiting their ability to obtain loans and reducing the book value of their properties.

Knowledge of carbon markets and their potential requires a 'whole of government' approach. Capacity across the Queensland Government and institutions must be enhanced to ensure the economic potential from carbon offsets is obtained. Currently institutional knowledge is fragmented and inconsistent. Each institution must understand the role of carbon markets, how they cross-over with their core objectives and how they can enhance Queensland's economic position.

There is also a perception among landholders that offset projects will 'lock up' land that could be otherwise used for agriculture. This has the potential to reduce participation and negatively impact the valuation of properties with existing offset projects. Despite this perception, many offset projects are complementary to landholders' existing core business and create productivity benefits due to improved land management practices. In addition, offsets are providing a new source of revenue. These benefits need to be understood and fairly accounted for by banks and financiers when assessing land value.

The Department of Environment and Heritage Protection (the Department) could assist by supporting knowledge sharing across all areas of the value chain. This includes developing the capacity of government, landholders, and institutions (including industry groups, suppliers, aggregators, professional advisors, banks and financiers) to understand the opportunities available, expected service standards, attributable co-benefits, obligations associated with participation, and where to go for assistance.

The key objectives are to:

- improve the quality and relevance of information
- enable the assessment of technical and commercial risks and opportunities
- encourage the development of trusted relationships between specialists and landholders
- improve the sharing of information between existing participants, potential participants, specialists, industry bodies and community groups.

Recommendations

Developing government, landholder and institutional knowledge requires a stakeholder engagement and capacity development strategy that includes:

- analysis of stakeholder information needs. For example, for landholders additional information is required to understand the opportunities, benefits, costs, and risks of participating in carbon offset markets
- mapping the key barriers from the perspective of each major stakeholder group
- understanding the skill gaps. For example for the banks and financiers, the reasonable financial valuation of both risks and benefits from offset projects and how this might impact on land valuation and credit worthiness
- addressing each barrier, tailored to individual stakeholders. For example, how specialists currently assist with accessing the market and how they could assist smaller participants in the future
- running regular capacity and knowledge building sessions for state and local government officers responsible for implementing and supporting the land sector carbon farmers.

5.1.3. Limited business and financial models

Given the diverse characteristics of landholders and the range of ways offsets can be created, commercial and financial models that can address a wide variety of circumstances are needed. Aggregation of multiple projects within the same activity is a critical way to support potential offsets creation and has been successfully implemented across a number of methodologies. However, the aggregation models that have emerged have still not been able to reduce transaction costs for many smaller landholders sufficiently to encourage their participation. The agricultural sector has also noted that while farmers may have capability to generate offsets across multiple methods, the lack of an integrated whole-of-farm systems approach means that each activity comes with its own separate regulatory burden[18].

The ability of many landholders to access finance is heavily influenced by unpredictable external factors such as weather, commodity price movements and constraints such as small project scale and geographic isolation[19]. Private and public financial institutions have developed innovative approaches to financing investments that reduce landholders' energy use and emissions, but there appears to be significant scope for more innovation in financing for offset opportunities.

Recommendations

Recommendations for the Queensland Government to address this barrier include:

- examining synergies between carbon offsets and other environmental policies on opportunities for expanded market-based mechanisms that support outcomes such as biodiversity enhancement and protection, reef protection, climate adaptation, water quality improvement and protection, and riparian restoration
- working with the Australian Government to develop a robust scientific approach for an effective and verifiable whole-of-farm method under the ERF
- collaborating with stakeholders to develop strategies or support programs to better understand and address the constraints of existing commercial and financing models.

5.1.4. High transaction and participation costs

All the barriers discussed above contribute to higher costs for participants. Project overhead costs (data collection, monitoring, compliance, and audit) can be high for many activities, reducing the incentive to participate. For smaller landholders there is also little scope for economies of scale. Given the risks associated with the long term nature of projects for example, requiring emissions benefits to be maintained for 100 years in the case of sequestration projects, prospective benefits may not be seen as outweighing costs. For some projects, aggregation has the potential to share, and therefore lower, compliance and other costs.

In time, the competitive conditions inherent in a robust offset market may drive lower costs, as may advancements in technology. However, several cost barriers will require targeted intervention. For example the provision of standardised information will assist in reducing transaction and participations costs. Queensland has already delivered high quality tools such as the Regrowth Benefits Tool[20] which provides a strong foundation basis. This approach can be extended to a

18 http://www.nff.org.au/get/submissions/5710.pdf
19 http://www.cefc.com.au/media/290083/cefc-submission-to-the-australian-government-review-of-climate-change-policies.pdf
20 Department of Environment and Heritage Protection, 2016, Regrowth benefits, Queensland Government, http://environment.ehp.qld.gov.au/regrowth-benefits/ , accessed 13 September 2017

'tree carbon prospecting' tool which identifies areas of high potential for biosequestration projects, ongoing maintenance of datasets and translation of data into usable products will be required. Similar tools for other offsets can also be investigated and developed.

Recommendations

Queensland to investigate ways by which transaction costs can be reduced. This includes:

- encouraging collaboration and knowledge sharing within industry through the implementation of other recommendations in this report as well as other approaches such as regular newsletters, contact officers, and web-based support tools
- providing standardised information to optimise and simplify where possible, assessment, monitoring and audit functions
- investigating complementary measures to access the market where transaction barriers inhibit participation.

5.2. Longer-term issues: 2020-2030

Some of the barriers to the long-term growth and health of an offsets market depend on the market itself. Others relate to the broader contexts of climate policy, climate change and land use. Barriers include:

- uncertain climate policy (domestic and international)
- limited methodologies/activities placing a technical limit on market size
- valuation of co-benefits
- potential loss of social licence
- physical impacts of climate change.

5.2.1. Uncertain climate policy (domestic and international)

Uncertainty regarding carbon market development and broader climate policy settings decreases the demand for offsets, increases the risk profile of offset projects, and deters investment in long-term research and development. Weak global consensus on the need for mitigation, or abandoning of international targets, is also a significant risk to long-term market sustainability.

International processes are currently underway to set the rules for international offset trade. The long term value and scale of Australia's offset markets will be strongly influenced by these rules and the ability of ACCUs to be used as an acceptable internationally traded offset unit.

Recommendations

The Queensland Government to:

- engage with the Australian Government on Article 6 of the Paris Agreement (which governs international trade of carbon offsets) in a way which aligns with Australia's methods, governance standards, and additionality criteria, and maximises the potential value to our domestic offset industry
- engage with the Australian Government to advocate for the establishment of bilateral trade with other countries that are interested in carbon trading. This could involve joining a 'carbon club', an option which is currently being investigated by South Korea, China, and Japan

- engage bilaterally with other subnational governments that have an interest in carbon trading, such as California, British Columbia, and Alberta.

5.2.2. Limited methodologies/activities placing a technical limit on market size

There is a wide range of potential land offset activities, but to date implementation in Queensland has been heavily weighted toward native forest regeneration and the uptake of several activities is minimal (Figure 6). Market dependence on a narrow range of methodologies limits the motivation and ability of landholders to participate. This restricts market growth, diversification and resilience.

In addition, if the market remains reliant on activities that are or can be made commercially viable in the short term, its value and growth potential will be constrained, and significant potential opportunities will not be realised. The long lead time to an approved methodology means that capturing the offset potential in newer areas such as sequestration in coastal ecosystems (blue carbon) requires investment in research, development and demonstration (RDD) (technical, policy, and commercial) to start now and be sustained over the long term.

Recommendations

The Queensland Government to work with industry and the research sector to develop a research program to enable a wider range of potential technologies and activities to advance from early-stage research to commercial deployment as an approved ACCU Method. This includes a long term plan and stable financial support for:

- taking potential activities from early stage knowledge generation to credible and approved ERF Methods
- policy and regulatory framework development to support a carbon market 'commercialisation hub' combining research, commercialisation and new ventures
- commercial pilots to demonstrate viability and cost.

The Queensland Government should work collaboratively with the research, agricultural industry and the Australian Government on these actions. Queensland may consider targeting research support toward activities with the greatest potential in the state.

5.2.3. Valuation of co-benefits

The development of a strong offset market has the potential to provide significant benefits beyond achieving emissions reductions. These include co-benefits to biodiversity, landscape protection, water quality improvements, as well as economic opportunities for indigenous communities and productivity improvements for agriculture.

Queensland has an opportunity to build on its existing relationships under the Catchment Conservation Alliance and Connectivity Group memoranda of understanding. These agreements between the Department and Green Collar Group, Queensland Regional Natural Resource Management Groups Collective, Forests Alive, and Corporate Carbon, commit to providing land sector carbon abatement while also delivering environmental co-benefits such as improved Great Barrier Reef water quality and biodiversity outcomes. A key opportunity lies with the Great Barrier Reef.

By valuing co-benefits, projects have the potential to become more economically attractive to landholders. Various types of offsets may produce one or more co-benefits as a by-product, but optimising co-benefits is likely to require specific incentives and supporting frameworks.

Table 1. Co-benefits associated with carbon offsets

Co-benefit	Description of value
Biodiversity	Biodiversity can be preserved and enhanced through a wide range of existing activities. Further biodiversity gains can be accessed through the development of blue carbon activities. Biodiversity can be seen both as an intrinsic good and as an important component of Queensland's economy via ecosystem services and tourism.
Landscape protection and water quality improvements	Some land sector offsets can prevent land degradation, reduce run-off and reduce water pollution or salinity. For example, soil carbon improves soil functions, delivering greater retention of nutrients and microbes and reducing runoff of pollutants and soil into water systems. Savannah burning reduces fire risks and preserves ecosystems and habitats. Vegetation can reduce water salinity. Carbon offset projects have significant potential to contribute to the health of the Great Barrier Reef through improvements in water quality and reduced runoff.
Indigenous communities	Methods such as savanna burning can leverage the traditional ecological knowledge of Indigenous people, while providing remote Indigenous communities with job opportunities and a means to maintain their land management practices. The Queensland Government is already investing in work to develop a method for valuing the socio-cultural benefits of Indigenous participation in carbon farming and markets. This method known as the Core Benefits method is being developed by the Aboriginal Carbon Fund with funding from the Queensland Government.
Agricultural improvements	Afforestation activities can allow for plantings that also provide shelter for livestock, wind breaks and targeted salinity reduction. These can also improve amenity. Methods that improve soil health and change livestock feed can also improve agricultural productivity.

Whilst co-benefits can be easily described, there is currently no market to determine the financial value of co-benefits from carbon abatement projects. Although abatement projects with certified co-benefits (for example Gold Standard[21]) are able to command a premium price on the voluntary

21 The Gold Standard https://www.goldstandard.org/

market, these represent a very small portion of total demand. The key barrier is the lack of a framework for co-benefits valuation that is robust in scientific, regulatory and commercial terms.

Moreover, co-benefits' valuation frameworks have the potential to add significant complexity to processes of assessing and allocating value, auditing impacts and compliance. This could potentially increase the transaction costs of carbon offsets production and create misaligned incentives and policy regimes.

In the absence of a higher carbon price, the valuation of co-benefits is critical to expanding participation in carbon markets. This could be via direct financial valuation in a scheme established for this purpose, or indirect valuation of the social, community, biodiversity, or other co-benefits. Business regards co-benefits as attractive for their potential to contribute to their social licence to operate and their performance against voluntary initiatives such as the United Nations' Sustainable Development Goals (SDGs). With the increased uptake of state-based emissions targets, local offsets may also be more attractive to meet these longer term goals. While this would not standardise the valuation of co-benefits (in the same way a scheme to directly value these benefits would), it may still allow a higher price to be received for land sector offsets than would otherwise be the case.

Developing robust markets (within the state or nationally) to value and incentivise co-benefits is a medium to long-term commitment, given the need to ensure scientific credibility and appropriate policy settings. In the meantime, co-benefits may be accessed through targeted policies, policy adjustments or incentive programs.

Recommendations

The Queensland Government needs to:

- research how co-benefits are produced including interactions of multiple co-benefits and with abatement activities
- research how co-benefits are valued including intrinsic or societal benefits, contribution through improved ecosystem services to other economic activities such as farming
- define how co-benefits can be allocated through systems of monetisation, allocation, trading, integration with pre-existing offsets framework
- develop best practice policy and regulatory frameworks to support the development of a co-benefits market in Queensland. This requires a mapping of core priorities, for example Reef protection and how this policy interacts with carbon offsets
- continue piloting collaborative approaches with industry to demonstrate the efficacy of co-benefits and the value created for Queensland.

The Department must also identify which types of co-benefits may be appropriately accessed in the near term through non-market mechanisms such as knowledge-sharing, industry-led best-practice frameworks, subsidies or if necessary regulatory interventions.

5.2.4. Potential for loss of social licence

New and growing industries can often face societal resistance, particularly when they involve changes in land use and/or unfamiliar activities which have benefits and risks that are not well-known. Concerns about the impacts of offsets on availability of land for other uses have already been expressed and could increase. Another risk could be the potential dominance of methods

that maximise carbon value but undercut other social goods. For example, monoculture plantation forests that can be efficient in terms of offset provision but reduce biodiversity and amenity.

Another aspect of social licence is related to the interaction between industry participants and the wider community. Where industry activities evolve or expand much faster than public understanding, fears and misperceptions can arise that lead to social pressures for industry constraints. Ensuring that industries adhere to high standards of corporate behaviour and communication can mitigate this risk. The development of a Voluntary Code of Conduct is an important step in this regard. Ensuring realisation of co-benefits can also reduce the risk to social licence by aligning industry development with broader social and economic values.

Recommendation

As noted above, the Queensland Government should determine its role in improving communication and information-sharing between existing participants, potential participants, specialists, industry bodies, and community groups. This role should include monitoring trends in industry actions and concerns, in order to inform the development of responses where these become necessary.

5.2.5. Physical impacts of climate change

Stronger than projected near-term climate impacts such as droughts, increased ferocity of fires, changes to weather patterns and higher temperatures present a risk to land sector projects and the locations in which these offsets can be created. This will impact the financial viability and risk profile for projects.

The Queensland Government invests in climate change information and adaptation tools and strategies for the land sector. This information and tools are transferrable and relevant to managing climate risk by the carbon farming sector.

Recommendation

Queensland to continue:

- developing strong state mitigation policies
- advocating for robust national mitigation policies
- investing in climate change adaptation research and information tools to support the carbon farming sector to be resilient to climate change impacts.

Other recommendations in this section summarise how Queensland can potentially support the State's participation in the market in the near term and beyond.

6. Conclusion

Significant economic potential is available from land sector offsets in Queensland, estimated to be $1.4 - $4.7 billion by 2030. Policy uncertainty, and more immediately the likely exhaustion of Australian Government funding under the ERF program in the next 12 months, presents a risk to the value which can be realised in the near term. However, beyond 2030 the value of offsets to the

Queensland economy is expected to increase with the development of international carbon markets to achieve targets under the Paris Agreement.

The creation of a strong carbon offset industry will contribute to future proofing Queensland by accessing revenue streams from domestic and international carbon trading to 2030 and beyond and realising co-benefits which have significant economic, environmental and social value. By incorporating ecosystem services into policy and economic considerations, significant value will be created for Queensland. The Great Barrier Reef in particular would benefit.

Appendix A Method and assumptions

Data sources

The potential value of carbon offsets for Queensland from the land sector draws upon research conducted by the CSIRO[22]. The research focuses on two scenarios for land use change:

- Central Scenario: Assumes that carbon plantings need to be at least twice as profitable as their current use before land use change occurs.
- ANO Scenario: Applies an uptake curve which assumes that land use change occurs over 16 years (with half in the first eight years) once the new land use becomes more profitable than the old use.

Our analysis utilises the Central Scenario to provide an indication of the abatement potential from the land sector. This scenario predicted less land use change over the period to 2030 than was predicted by the ANO scenario. For conservativeness, the CSIRO model also uses a risk buffer reduce the abatement achieved by land sector projects by 20%. It's important to note that the CSIRO study predicts a level of abatement potential from the land sector which is far in excess of the abatement demand in each of our three scenarios. We utilise the land sector to fill the gap between business-as-usual, abatement realised by other economic activities in Australia and any international demand. As a result we assume the full potential abatement from the land sector is not realised which in turn avoids flooding the market and depressing the price.

The cost of abatement and abatement potential from sectors other than the land sector drew on previous work completed by Energetics for the Department of Environment and Energy[23]. This analysis identified abatement potential across the Australian economy, the volume of abatement available and cost per tCO_2e. From this analysis a domestic carbon price estimate is developed based on the cost of abatement to meet either the 26-28% reduction target or a 2°C target. Energetics' publicly available report[23] lists sources and assumptions used for that work.

A key departure from our previous work for the Department of Environment and Energy was the assumption used for the decarbonisation of the grid. For conservativeness this work assumes that there is an increase in renewable energy in Australia's electricity supply (beyond the level required by the Renewable Energy Target) which will displace coal fired generation, decrease emissions from electricity and result in an overall fall in national emissions. Ultimately this assumption results in a lower demand for offsets from Queensland LULUCF projects than would otherwise be the case.

Our international price forecasts were based on various publicly available sources. To inform international demand we also used the estimated shortfall on countries' Paris Agreement targets based on analysis completed by Climate Action Tracker[24].

22 https://www.csiro.au/en/Research/Major-initiatives/Australian-National-Outlook/National-Outlook-publications/Key-science-papers/Potential-carbon-sequestration
23 http://www.energetics.com.au/getattachment/Resources/National-Abatement-Opportunities-Centre/20160506-Modelling-and-analysis-of-Australia-s-abatement-opportunities-Energetics-Report.pdf.aspx
24

Method

Our analysis presents three scenarios which consider the impact of:

- demand domestically and globally
- price domestically and globally
- supply of offsets and abatement domestically which are economic at the modelled carbon prices from the land sector and non-land sectors.

Where there is an excess supply, we assume that the land sector and other sectors provide offsets to market in proportion to their relative ability to supply. This assumes that the market is not flooded to avoid depressing the price. Table 2 provides more information about the assumptions and references used.

Values in this report are in AUD and are nominal. The analysis is based on current policy settings unless otherwise mentioned (eg. an Australian Paris Agreement target aligned with the 2°C trajectory goes beyond current policy).

Table 2: References, method and assumptions

	References, method and assumptions
Business-as-usual emissions trajectory for Australia	Energetics: *Modelling and analysis of Australia's abatement opportunities*, 2016.
Domestic abatement opportunities and cost of abatement	Energetics: *Modelling and analysis of Australia's abatement opportunities*, 2016. We also assume that decarbonisation of the grid accelerates beyond the Renewable Energy Target levels once the relevant technologies become economic at the forecast carbon price.
Capacity of the land sector to supply abatement	CSIRO: *Potential for Australian land-sector carbon sequestration and implications for land use, food, water and biodiversity, Report for the Australian National Outlook,* 2015. Energetics: *Modelling and analysis of Australia's abatement opportunities*, 2016. Not all of the potential from the land sector is realised. Offsets from the land sector fill the gap between the required level of decarbonisation and the share of abatement delivered by other economically favourable opportunities.

References, method and assumptions	
Share of land sector abatement from Queensland	Share of LULUCF sector abatement from Queensland to date (as sourced from the ERF carbon abatement contract register) is used as a proxy for the potential share to be delivered by these projects in the future. This was checked for reasonableness against the ability of the Queensland land sector to supply abatement from regrowth projects (based on recent clearing) using figure 1 of R.J. Fensham, G.P. Guymer *Carbon accumulation through ecosystem recovery*, January 2009.
Domestic demand for abatement	Demand for offsets is driven by the shortfall between business-as-usual, economic abatement opportunities within the economy and Australia's abatement target at its current level (26-28% reduction on 2015 levels by 2030) and at a level in line with a 2°C objective (45% reduction on 2015 levels by 2030). In international trading scenarios, we assume that Australia will purchase offsets from international markets when they are 25% cheaper than domestic offsets up to a cap. Australia has a historical precedent of capping units from international markets in our domestic compliance schemes.
International demand for abatement	Demand for offsets from our domestic market is driven by the Paris Agreement target shortfalls of our trading partners (or the global shortfall in the global harmony scenario) in 2030 as forecast by Carbon Action Tracker. We assume: • countries purchase a maximum of 30% of their shortfall from international markets, with the assumption that most countries will favour domestic offsets where economic opportunities are available • countries purchase 25% of their Paris Agreement shortfall prior to 2025 and the remaining 75% is purchased evenly across the period 2025-2030 • in scenario 2 (multilateral linkage) Australia supplies offsets into international markets in proportion to the number of countries participating in international linkage and those countries with Paris Agreement shortfalls • in scenario 3 (global harmony) we assume that 5% of the global Paris Agreement shortfall can be provided from Australian offsets. We assume that the US does not re-join the Paris Agreement in the period to 2030.

References, method and assumptions	
International carbon prices	Various publicly available carbon price forecasts for individual countries and global markets were used. For the purpose of scenario 2, prices were also weighted based on the countries' Paris Agreement shortfalls and the assumed timing of linkage. International carbon prices were converted to AUD using the exchange rate at the time of analysis (July 2017).
Scenario 1 – Domestic only	We assume that there is no trade of ACCUs internationally and that international units cannot be used to meet domestic compliance requirements under the Safeguard Mechanism or to achieve Australia's Paris Agreement target. We consider potential domestic demand based on our current Paris Agreement target and a more ambitious target based on the 2°C trajectory.
Scenario 2 – Multilateral linkage	We assume that Australia forms some linkages with international markets over the period. Our assumptions about which countries link and the timing of linkage take into account: • current appetite by countries to explore linkage opportunities • projected Paris Agreement shortfalls • maturity of their carbon markets • proposed development of markets.
Scenario 3 – Global harmony	After an estimated lead time to establish rules and markets (during which time we assume some multilateral linkage occurs), we assume that a global market is established towards the later end of the period which allows trade between all parties to the Paris Agreement. When international trade occurs the price is dictated by global carbon price forecasts available in the public domain. The global prices were sense-checked against a weighted average of the shortfalls and carbon prices from Australia's key trading partners and were found to be within a similar range.

Appendix B Attributes of robust carbon markets

Table 3 outlines the stages of development of a robust offsets market, noting the barriers to progress, the potential for co-benefits and the policy priorities at each stage.

Table 3: Stages of development of a robust offsets market

Market stage	Early development	Growth	Competition	Maturation
Stage features	Establishment of ground rules, few participants, experimentation, fragility.	Successful business models and processes established, declining costs, rising participation	Diversification of products, models, participants, drivers	Saturation of some segments, need for market expansion and evolution
Policy aim	Drive development by setting ground rules, sharing information, encouraging participation	Facilitate growth by expanding options for offset provision and purchase, reducing costs and risks	Foster competition and resilience	Prevent saturation and decline by expanding sources of demand and/or supply
Barriers to progress	Lack of information High costs and risks Limited methodologies Limited models		Increased complexity Regulatory restrictions on growth Technical limits on market	
Risks	Climate policy development Lack of demand		Limits on market size Challenges to social licence Physical impacts of climate change	
Policies	R&D, commercial trials, method development	Encourage information sharing and reduce costs	Break down barriers to market size	Manage potential adverse outcomes (social licence)

Market stage	Early development	Growth	Competition	Maturation
Co-benefits achievement	Minimal realisation of co-benefits	Demonstration of co-benefits from specific projects or approaches	Access to co-benefits creates additional sources of value, incentivises diversification across market and participants, strengthens social licence in community	Expansion to new sources of co-benefits

Energetics awards

2016

Winner of Financial Review Client Choice Awards

- **Niche Firm Leader**

Finalist of Financial Review Client Choice Awards

- **Best Consulting Engineering Firm with Revenue <$50m**

2015

Winner

- **Australian Business Award for Service Excellence**
- **Australian Business Award for Marketing Excellence**

2014

Winner of BRW Client Choice Awards

- **Best Professional Services Firm (revenue < $50M)**
- **Best Consulting Engineering Firm (revenue < $50M)**
- **Best Value**

Finalist of BRW Client Choice Awards in 3 categories

- **Best Client Service**
- **Most Friendly**
- **Most Innovative**

2013

Finalist

- **BRW Client Choice Award for Best Client Relationship Management**
- **Leading in Sustainability Banksia Award**

2012

Winner

- **Australian Business Award for Recommended Employer**
- **Australian Business Award for Service Excellence**

Contact details

Energetics is a carbon neutral company

www.energetics.com.au

Brisbane
Level 12, 410 Queen St, Brisbane Qld 4000
Ph: +61 7 3230 8800
Fax: +61 2 9929 3922

Melbourne
Level 5, 190 Queen St, Melbourne VIC 3000
PO Box 652, CSW Melbourne VIC 8007
Ph: +61 3 9691 5500
Fax: +61 2 9929 3922

Adelaide
Level 1, Mitsubishi Admin Building
1 Tonsley Boulevard
Tonsley 5042
Ph: +61 3 9691 5509
Fax: +61 2 9929 3922

Perth
Level 3, 182 St Georges Tce, Perth WA 6000
Ph: +61 8 9429 6400
Fax: +61 2 9929 3922

Sydney
Level 7, 132 Arthur St, North Sydney NSW 2060
PO Box 294 North Sydney NSW 2059
Ph: +61 2 9929 3911
Fax: +61 2 9929 3922

abn 67 001 204 039
acn 001 204 039
afsl 329935