

Reef Bank – concepts, options and opportunities



A draft report for the WWF

18 June 2013



MainStream

MainStream Economics and Policy is a boutique consultancy providing research, economics, planning and policy analysis, evaluation, strategy and business advice for the natural and built environments.

We bring rigorous analysis, insight, knowledge, experience, open communication and a passion for results to all of our projects.

Key contact

Jim Binney (Principal)
MainStream Economics and Policy
Level 2
52a Jephson St.
Toowong Qld 4066
PO Box 13048 George St.
Brisbane Qld 4003

Report authors

Jim Binney and Dr Chris Fleming

Disclaimer

While MainStream Economics and Policy endeavours to provide reliable analysis and believes the material presented in this Report is accurate, it will not be liable for any party acting on such information.

TABLE OF CONTENTS

Executive summary	1
1 Introduction and context	3
2 Reef Bank – key concepts and functions	6
2.1 Key functions	6
2.2 Potential benefits.....	7
3 Funds consolidation function.....	10
3.1 Overview of sources of funds	10
3.2 Water quality offsets	11
3.2.1 Extending a water quality offsets framework to include partial financial consideration	12
3.2.2 Water quality offset banking.....	14
3.3 Reef Bonds.....	14
3.4 Other sources of funds	15
3.4.1 Developer charges	15
3.4.2 Licence fees.....	15
3.4.3 Efficient pollution charging	16
3.4.4 Budget appropriations.....	16
3.4.5 Catchment management and environmental levies.....	16
3.4.6 Adjustments to bulk water charges	16
3.4.7 Nature-based tourism levy	16
3.4.8 Philanthropic funding	17
3.5 Options	17
4 Funds management function.....	18
4.1 Governance requirements.....	18
4.2 Operational and administrative functions.....	19
4.3 Options	20
4.3.1 Initial corporate and institutional architecture.....	20
4.3.2 Scale and risk management	20
5 Disbursement function.....	22
5.1 Non-repayable funds.....	22
5.1.1 Principles for disbursement – non-repayable funds.....	22
5.1.2 Prioritisation based on cost-effectiveness.....	22
5.1.3 Possible multiple approaches for a single pollutant.....	23
5.2 Lending.....	24
5.3 Options	25
5.3.1 Single or multiple approaches to distribute funds?	25
5.3.2 Operate independently or collaboratively?.....	26
6 A way forward.....	27
6.1 Phase 1: Detailed feasibility and business case design	27
6.2 Phase 2: Detailed feasibility and business case	27
6.3 Phase 3: Real-world pilot.....	28
6.4 Next step	28
References – cited in text	30
Other references.....	31

Executive summary

MainStream Economics and Policy has been engaged by the World Wildlife Fund and the Australian Marine Conservation Society to develop an options paper on the concept of a 'Reef Bank', the purpose of which is to facilitate an improved and increased allocation of investment funds towards preserving the Great Barrier Reef (GBR).

The rationale for considering the concept of a Reef Bank stems from the observation that, despite considerable public and private investment devoted to preserving the GBR, there is consensus among the scientific community that the GBR is in decline. Moreover, it is clear that the current level of investment in protecting the GBR is inadequate, and often poorly targeted, designed and/or implemented.

The key findings of this paper are:

- The GBR is a nationally and internationally significant natural asset requiring effective and sufficient management/investment in order to ensure the value of the asset is maintained – preferably restored.
- There is significant scope to enhance the way investments into the resilience of the GBR are undertaken.
- A Reef Bank could deliver multiple functions and could operate across a suite of non-commercial and commercial activities.
- There are multiple sources of funding that could be partially or fully managed by a Reef Bank.
- There are potentially significant environmental and financial gains to be made by astute use of a financial offsets facility in conjunction with physical offset requirements. A Reef Bank is an ideal method for consolidating and distributing funds raised through a financial offsets mechanism.
- A Reef Bank could provide a critical role in innovative water quality financing and in facilitating the use of market mechanisms such as water quality offset banking.
- The responsible investment market in Australia is worth approximately \$180 billion. Little has been done to tap into this market to access private capital for projects that are commercially viable and enhance GBR resilience.
- There are multiple sources of potential funds that could be managed by a Reef Bank (see Sections 3.2 to 3.4). However, most of these sources are partially or fully reliant on Government investment.
- While governance requirements are significant, they are not onerous relative to the potential benefits of a Reef Bank.
- Fund disbursement should be underpinned by sound scientific, economic and commercial principles.

We therefore make the following recommendations:

Recommendation 1: The concept of a Reef Bank has a number of merits and further consideration should be given to the potential for establishing such an institution.

Recommendation 2: It would be prudent to undertake a comprehensive review and evaluation of all potential funding sources (in conjunction with a review of other complimentary policies) in order to establish an innovative, effective and economically efficient policy prescription for the GBR. This should be undertaken irrespective of whether a Reef Bank is pursued or not.

Recommendation 3: Further investigate how water quality offsets could be established to benefit both development and the resilience of the GBR.

Recommendation 4: Investigate the real market potential of Reef Bonds in more detail.

Recommendation 5: If a Reef Bank is to be successful, it is absolutely crucial that innovative funding sources, such as financial water quality offsets or Reef Bonds, be pursued.

Recommendation 6: Detailed identification and scoping of Reef Bank functions should be undertaken as the next phase of any feasibility assessment of a Reef Bank.

Recommendation 7: Options to achieve the functionality and objectives of a Reef Bank without the need to establish a large governance structure are more appropriate until the concept has proven its worth.

Recommendation 8: Given uncertainties regarding the demand for Reef Bank services and functions, a pilot trial in conjunction with a robust evaluation would be appropriate before going to a large scale application.

Recommendation 9: There is significant evidence to suggest that there are high levels in variability of pollution abatement costs across the GBR catchments. This indicates that prioritisation of funding based on cost-effectiveness principles could provide significant efficiency gains.

Recommendation 10: Multiple fund distribution approaches are required to ensure investment into the GBR's resilience is maximised. This necessarily includes loans for "win-win" projects where appropriate access to capital is the constraining factor on actions.

Recommendation 11: The Reef Bank should actively seek out partners and collaborative arrangements to ensure funds are distributed in an effective and efficient manner.

1 Introduction and context

The Great Barrier Reef (GBR) is the world's most extensive coral reef system and has some of the richest biological diversity on Earth (Australian Government, 2012). However, there is consensus among the scientific community that the condition of the GBR is declining. There are a number of significant actions that could be undertaken to mitigate this decline, including the reduction of pollutant loads, better management of coastal and industrial development, and better management of fisheries (Brodie et al., 2008),

While natural fluctuations in the GBR's condition are to be expected, these fluctuations are exacerbated by climate change and other anthropogenic pressures such as land use intensification, runoff from farming and coastal development (Australian Government, 2013). The GBR's decline is, in part, due to market failures and perverse policy and regulatory outcomes that result in economic activity being undertaken that exacerbates the risks to the GBR (Binney, 2010).

The GBR directly and indirectly provides a suite of economic goods and services that have a significant value. A number of studies have attempted to review the value of the GBR (see for example, Access Economics, 2009). As outlined in Table 1, the most comprehensive study undertaken to date values the GBR at \$51.4 billion (Oxford Economics, 2009).¹ Much of this value can be expected to decline as the GBR declines (Kragt et al., 2009). Much of the community would also argue that the value of the GBR is significantly higher.

Table 1: Present value of the GBR (2009 dollars)

Description	Present Value (\$ billion)
Tourism consumer surplus	16.6
Tourism producer surplus (profit)	3.6
Recreational fishing consumer surplus	2.5
Recreational fishing producer surplus (profit)	0.3
Commercial fishing producer surplus (profit)	1.4
Indirect use value	10.0
National non-use value	15.2
International non-use value	1.9
Total	51.4

Source: Oxford Economics, 2009

Key finding

- The GBR is a nationally and internationally significant natural asset requiring effective and sufficient management/investment in order to ensure the value of the asset is maintained – preferably restored.

Despite a broad range of policy interventions (e.g. regulations on land use) and investment (e.g. Reef Rescue), it is widely recognised that investments into maintaining and enhancing the resilience of the GBR are inadequate and that existing investments are sometimes poorly targeted, designed and/or implemented. For example grants are often distributed to landholders at cost sharing ratios that do not reflect the public/private split of benefits, landholders are sometimes paid to undertake projects they should be undertaking anyway, and constraints on program eligibility (e.g. landholders only) can exclude parties that may more effectively reduce risks to the GBR.

In addition, with the exception of some market-based instruments and cost sharing for some projects, limited attention has been paid to the mobilisation of private capital into projects that simultaneously generate commercial returns and environmental improvements. Clearly, there

¹ This value is estimated in 2009 Australian dollars on a PV basis over 100 years at a discount rate of 2.65%.

is a need to improve the way existing investments are made, as well as a need to facilitate additional investment into managing such a significant environmental asset.

While there is no detailed or consolidated stocktake of investment into enhancing the resilience of the GBR, MainStream's preliminary analysis (largely focussed on water quality investments) suggests this investment is in the range of \$380-480 million per annum (made up of both capital and operational investment). Given the partial nature of our analysis, the low end of the estimate is potentially a significant underestimate of total investment. Of the investment identified, around 75% is private investment, often to meet regulatory requirements or leveraged off Government investment.

There are a number of areas of investment where significant efficiency improvements could be achieved through greater coordination, targeting of actions and using more innovative approaches. These areas for potential improvement are shown by the shaded rows of Table 2. These investments add up to approximately \$270-350 million per annum (over 70% of the total). A Reef Bank would be able to improve the quality of this investment as well as mobilise more private sector capital.

Table 2: Indicative estimates of current annual investment (water quality focus)

Description	Value (\$ million per annum)	Comments and notes
Industry investment		
Resource and energy companies – capital expenditure	130 - 160	Total capital expenditures relating to reducing water quality risks. Based on ABS data on environmental expenditure and private capital formation for the mining and energy sector. These investments are consumed over the life of the resource project. Where reverse osmosis plants are required for CSG production, capital will be significantly higher, but investments will be irregular.
Resource and energy companies – operational expenditure	48 - 60	Total operational expenditures relating to reducing water quality risks. Based on ABS data on environmental expenditure and production costs, and State data on production. Assumes production of around 150 Mt in the GBR catchment.
Primary industries	80 - 120	Analysis of Caring for Country and Reef Rescue funding indicates farmer investment of at least 1.8 times Government investment. This is likely to be a significant underestimate as investment not tied to Government funding is excluded from the analysis.
Government investment		
Reef Rescue	40 - 50	Varies from year to year depending on project timing.
GBRMPA budget appropriation	49	Budget estimate of expenditures for 2012-13. These funds would not be impacted or available to Reef bank.
Reef Guardian Initiative	8	Funded out of Caring for Our Country budget.
Research	5 - 10	Budget for water quality research funding via the National Environment Research Program and Reef Rescue R&D programme. This will be an underestimate as research undertaken by other institutions is not included.
Other investment		
Urban development – water sensitive urban design (WSUD)	18 - 22	Estimated annual capital investment in WSUD. Based on population / dwelling establishment growth forecasts and previous estimates of costs.
Urban diffuse	N/A	While these costs are significant, the cost driver is primarily

wastewater treatment		human health related.
Total (range)	370 - 480	This data is an indicative estimate only and does not include all sources of investment. In addition, some investments covered in this table will relate to projects where water quality into the GBR may be a secondary consideration.

Source: MainStream Economics and Policy estimates

Key finding

- There is significant scope to enhance the way investments into the resilience of the GBR are undertaken.

2 Reef Bank – key concepts and functions

In its simplest form, a bank is a financial intermediary between parties wishing to lend money (i.e. depositors) and parties wishing to borrow money for worthy purposes.

The objective of the Reef Bank should be to enhance the effectiveness and efficiency of investment in the resilience of the GBR through:

- **The consolidation of some of the existing investment into more efficient projects and programmes.**
- **The provision of banking-like services for investments into projects that provide commercial *and* environmental benefits, but where the projects fall outside the normal scope of existing financing institutions.**

2.1 Key functions

This objective would be achieved via a legal institution and/or suite of functions that provides:

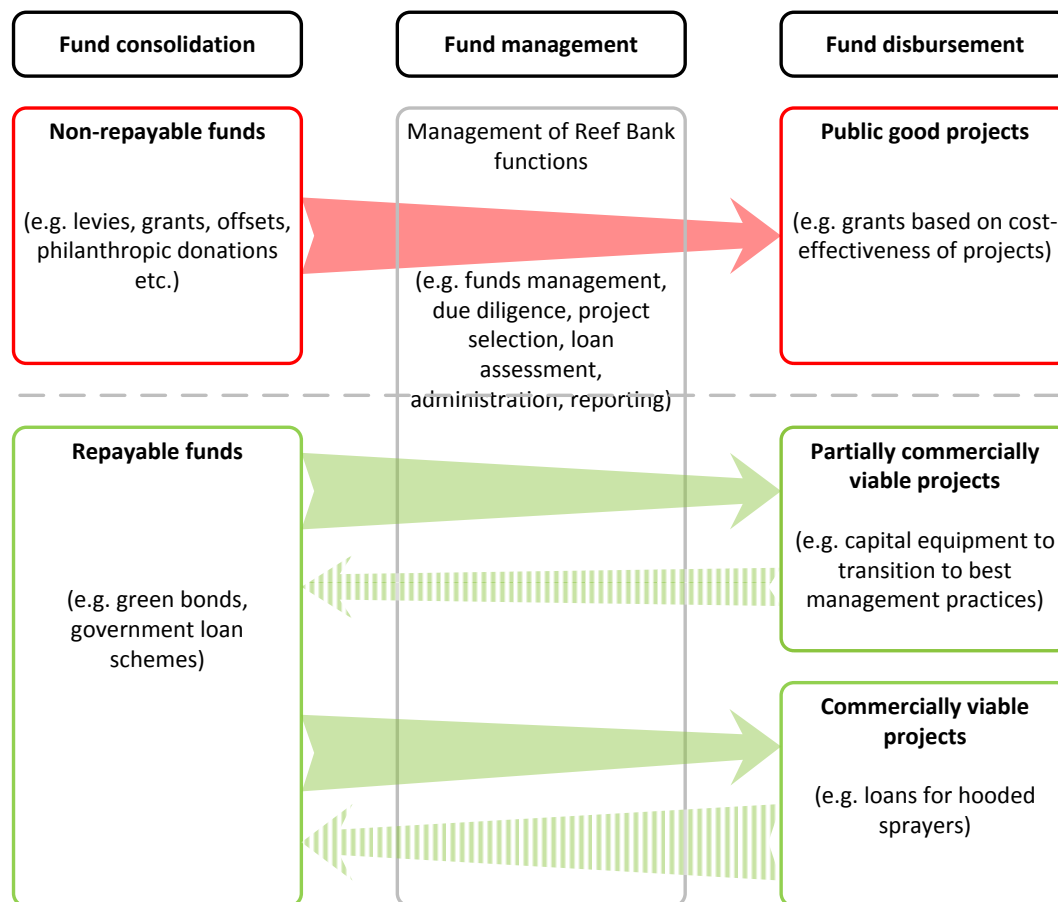
- **Fund consolidation.** Accept funds that are to be used for worthwhile projects that will enhance the resilience of the GBR, thereby consolidating funds from multiple sources to enable more efficient investment. There are two distinctive types of funds that are likely to be accepted by the Reef Bank. First, funds where there is no expectation that the funds would be recovered. This would include Government grants, funds required to meet regulatory requirements and philanthropic funds. Second, funds where there is an expectation that the funds will be repaid (at least partially). This would include commercial deposits and funds raised through the issue of bonds.
- **Fund management.** Manage funds (over the short and long term) on behalf of relevant parties in a transparent and legal manner. Pay interest in interest-bearing securities and charge interest for loans. This includes all relevant asset and liability management such as funds management, liquidity management, and administrative functions such as reporting and meeting regulatory requirements.
- **Fund disbursement.** Disburse funds to projects that are effective and economically efficient at enhancing the resilience of the GBR. This will include disbursement to projects as grants, disbursements to projects as loans, and disbursements to projects under some form of hybrid model (e.g. project repays 50% of funds). Whether funds are repaid will depend on the specific activities undertaken under the project and the specific funding requirements. For example, a grant for a project that provides no commercial benefit (e.g. retiring land from production) would generally not be repaid. However, a project that does provide commercial benefit (e.g. funding hooded sprayers to contractors for the sugar industry) would require repayment.

Figure 1 shows an indicative structure, key functions and flow of funds in a potential Reef Bank. In the diagram:

- Black boxes show the three principal functional lines of the Reef Bank.
- Red boxes indicate the fund consolidation and disbursement roles for non-commercial projects where funding recipients *are not* expected to repay the funds. Here the objective is to enhance the efficiency of existing projects and programs.
- Green boxes indicate the fund consolidation and disbursement roles for semi-commercial and fully commercial projects where funding recipients *are* expected to (at least partially) repay the funds. Here the objective is to attract a greater proportion of private investment into projects that provide sufficient capital returns and enhance GBR resilience.
- The grey box indicates the central functions of the Reef bank that operate across non-commercial and commercial activities.

- The grey dashed line indicates the distinction between commercial and non-commercial activities.
- The red arrow indicates the flow of funds for non-commercial projects.
- The green arrows indicate the flow of funds for semi-commercial and fully commercial projects and programmes. Note: striped arrows indicate the return of funds from borrowers to investors.

Figure 1: Reef Bank overview (functions and flow of funds)



Source: MainStream Economics and Policy

The potential structure and functions of a Reef Bank are explored in greater detail in the following sections of this Report.

Key finding

- A Reef Bank could deliver multiple functions and could operate across a suite of non-commercial and commercial activities.

2.2 Potential benefits

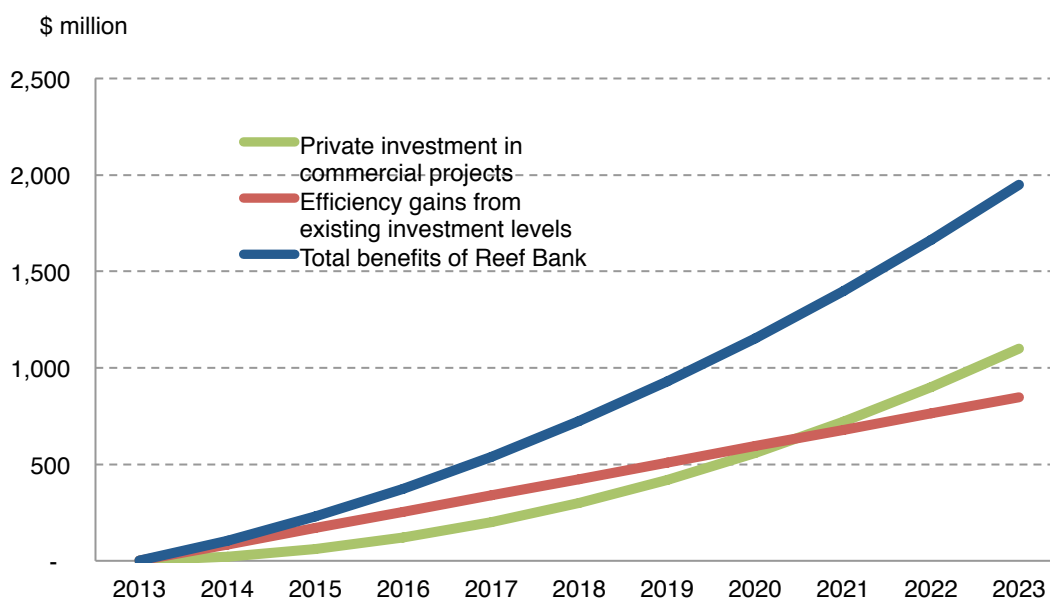
While it is beyond the scope of this study to identify, forecast and formally estimate the levels of Reef Bank activity and potential benefits, it is instructive to consider a feasible scenario that provides a broad indication of the potential benefits. These benefits must then be assessed against the potential costs of establishing a Reef Bank. In undertaking this exercise we have modelled a scenario where:

- The current high end of annual investment in water quality projects (from Table 2) is used as a base case.

- Efficiency gains are achieved across a number of existing investment categories. Specifically:
 - a 5% efficiency gain from mining and resource sector water quality capital investments via the use of offsets² and through the ability to pool investments in areas where mines discharge into the same river system;
 - a 5% efficiency gain from farmers' investment via access to Reef Bank investment not previously available, and via pooled investments;
 - a 15% efficiency gain from Reef Rescue funding (or future similar programs), via use of a broader suite of policy tools provided via the Reef Bank (e.g. loans in lieu of grants for commercially viable projects); and
 - a 15% efficiency gain in urban diffuse actions via access to facilitated offsets and pooled investments.
- Private sector capital to fund commercially viable projects that also enhance GBR resilience is made available via the Reef Bank. Initially this is equivalent to 0.2% of Australia's new private bond issues per annum, increasing to 2% over a ten year period. This assumes sufficient demand for project funding and sufficient investor appetite.

The possible cumulative benefits over ten years are shown in Figure 2. This simple scenario indicates that total benefits to one aspect of the GBR's resilience from the Reef Bank (namely water quality) could amount to almost \$2 billion over a ten year period through a mix of efficiency gains and new investment.

Figure 2: Possible cumulative benefits of a Reef Bank over ten years



Source: MainStream Economics and Policy

We estimate that Governments currently fund around 25% of total annual water quality investment in the GBR catchments. However, if you assume Government funding remains stable, the mobilisation of private capital facilitated by the Reef Bank could see that proportion fall dramatically (to around 5% of total annual investment).

While detailed analysis is beyond the scope and resources of this Report, the potential for very significant benefits provides a strong case for further development of the Reef Bank concept.

² Offsets are a policy tool used to replace environmental values lost through development. They are outlined in detail in Section 3.2

Recommendation

1. The concept of a Reef Bank has a number of merits and further consideration should be given to the potential for establishing such an institution.

3 Funds consolidation function

A key potential function of the Reef Bank would be as an accumulator and consolidator of funds to ultimately be disbursed to projects that enhance GBR resilience. This function is vital as it can underpin greater efficiencies and economies of scale from consolidated funding, and also because it can draw in greater levels of private funding than currently available for worthy projects.

3.1 Overview of sources of funds

There are a number of sources of funds that can be categorised according to:

- Whether funds are required to be repaid to investors or not.
- Whether funds are from public or private sources of capital.
- Whether the provision of funds is a regulated/Government decision, or voluntary.
- Whether the approach is currently commonly used in the GBR catchments or not.
- Whether funds could be invested through the Reef Bank (partially or fully).

These funding sources are briefly identified and classified in Table 3. They are then discussed further in Sections 3.2 to 3.4. Consistent with our project requirements, the bulk of the analysis focuses on the potential use of offsets and bonds, while other approaches are simply described.

Table 3: Potential sources of funds

Funding source	Repaid to investors (Y/N)?	Public or private capital?	Regulated / Government decision or voluntary?	Commonly used in GBR (Y/N)?	Invested through Reef Bank (partially/fully)?
Water quality offsets	N	Private	Regulated	N	Partially
Bonds	Y	Private	Voluntary	N	Fully
Developer charges	N	Private	Regulated	Y	Partially
Licence fees	N	Private	Regulated	Y	Partially
Load-based charges/taxes	N	Private	Regulated	N	Partially
Budget appropriations	N	Public	Government decision	Y	Partially
Catchment management levies	N	Private	Government decision	N	Partially
Water service charges reflecting risk to GBR	N	Private	Regulated	N	Partially
Nature-based tourism levy	N	Private	Regulated	Y	Partially
Philanthropic	N	Private	Voluntary	Y	Fully

Source: MainStream Economics and Policy analysis

It is worthwhile noting that:

- Many of these sources of funds require some form of regulation or Government decision (Commonwealth, State, or local). This reflects robust public policy where the mechanisms that generate these funding sources are designed to accumulate funding to address the negative impacts of regulated activities and/or to send a pricing signal to discourage activities that negatively impact on GBR resilience.

- Only a proportion of the potential funding sources are currently being utilised. Of those currently being used, most provide little (if any) effective price signal to modify behaviour and reduce risks to the GBR.
- The mechanisms used to raise funds are a mix of mechanisms. Some are funded by those who impact on the resilience of the reef (impactors). Some are funded by those who benefit from the GBR's condition (beneficiaries).
- The Reef Bank could play a significant role in enhancing the management and efficient distribution of funds from most potential sources. This reinforces the potential broad scope of sources of funds and clients of any Reef Bank.

Key finding

- There are multiple sources of funding that could be partially or fully managed by a Reef Bank.

Clearly there is likely to be significant benefits from a comprehensive review and evaluation of all potential funding sources (in conjunction with a review of other complementary policies) in order to establish an innovative, effective and economically efficient policy prescription for the GBR.

Recommendation

2. It would be prudent to undertake a comprehensive review and evaluation of all potential funding sources (in conjunction with a review of other complementary policies) in order to establish an innovative, effective and economically efficient policy prescription for the GBR. This should be undertaken irrespective of whether a Reef bank is pursued or not.

3.2 Water quality offsets

Offsets are a policy tool used to replace environmental values lost through development. Under regulated development requirements, projects go through a process to avoid and mitigate negative impacts on the actual development site. This often leaves a residual negative impact that can be offset by undertaking an equal and countervailing action on another site. Offset policies are typically underpinned by a number of relatively common criteria that also apply to waterway health objectives, including:

- Offsets should not replace or undermine existing environmental standards or regulatory requirements.
- Offsets should only be used once feasible and cost effective measures to avoid and mitigate on-site impacts of development have been exhausted.
- Offsets should result in a situation where there has at least been no net loss of GBR resilience from the development.
- Offsets should have a degree of environmental equivalence to the damage from the development. For example, the same pollutant type on the same catchment. Efforts have already been undertaken to establish metrics to underpin water quality offsets and other market approaches on the GBR.³
- Time lags between the impacts of the development and benefits of the offset should be minimised. Given typical lags between land management and load reductions, this could infer that offsets may need to be secured in advance of on-ground development works.

³ For example see: Eisner, R., Le Grand, J. and Norman, P. (2007) A Water Quality Metric for the Great Barrier Reef Catchments, Department of Natural Resources and Water, Brisbane; Rolfe, J., Windle, J., Muller, C. and Greiner, R. (2007) Designing a metric for conservation tenders at different levels of scope and scale, Using Conservation Tenders for Water Quality Improvements in the Burdekin, Research Report 3, Central Queensland University, Rockhampton.

- Offsets must be underpinned by secure legal agreements to ensure their ongoing provision for the period of the development’s impacts on GBR resilience.

Water quality offsets are becoming more common and are now receiving active consideration in Queensland. Previous economic analysis has shown that significant efficiency gains could be achieved by enabling greater use of water quality offsets in the GBR catchments, particularly as a way of mobilising investment from relatively high cost urban water quality improvement projects to alternatives in rural areas.⁴

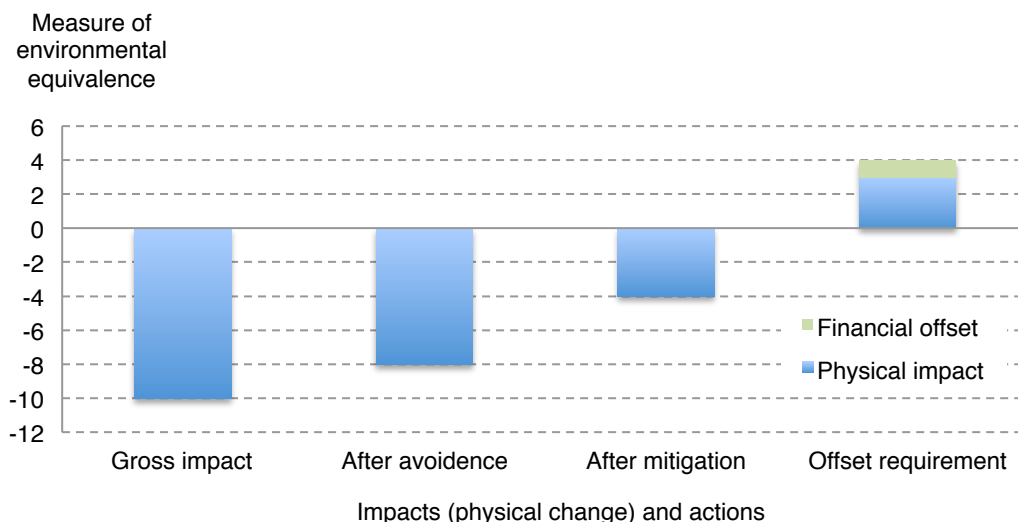
3.2.1 Extending a water quality offsets framework to include partial financial consideration

Traditionally offsets have been confined to the provision of physical offsets. However, there is an emerging interest in some circles to extend the current offsets framework to appropriately incorporate financial consideration in conjunction with the provision of physical offset projects. In effect, this creates two ways of meeting the offset requirement – physical projects and a financial offset. There are three key rationales for this approach:

- There simply may not be enough environmentally equivalent projects to fulfil the offset requirement; however there may be scope for residual offset requirements to be invested into higher priority projects.
- Often the marginal cost of securing additional offsets increases – potentially to a point where the costs of the offset exceed the environmental benefit. Again, a portion of offset investment could be more effectively utilised on other related (but different) environmental policies.
- There may be practical reasons why enforcing absolutely environmentally equivalent offsets may not be feasible (e.g. due to time lags).

Where a portion of the offset requirement is met via financial consideration, there is a potentially significant role for a Reef Bank to pool such funds and invest them in higher priority projects of a regional and/or GBR-wide significance. The extension of a typical water quality offset framework to include a partial financial offset is shown in Figure 3.

Figure 3: Water quality offset (including financial offset)



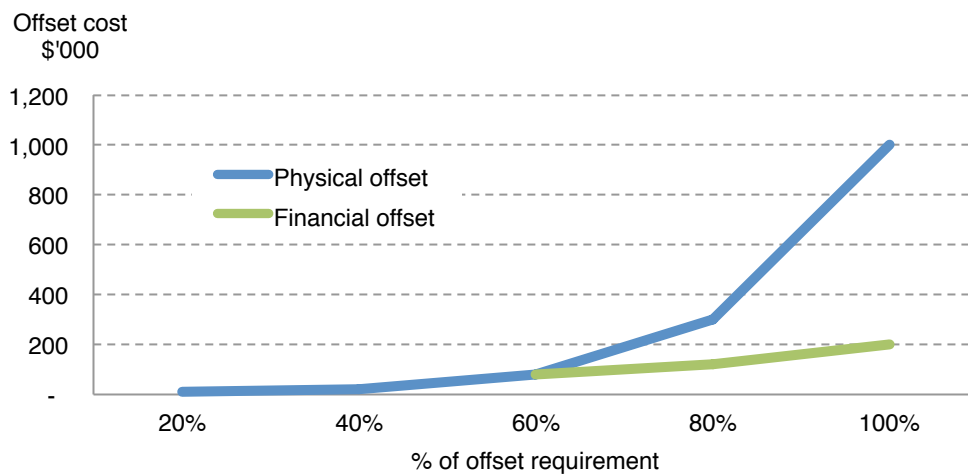
Source: MainStream Economics and Policy

⁴ For example see: Binney, J., Austin, A., Tunny, G., Prickett, K. and Fitzgibbons, A. (2013) Report on the economic and social impacts of protecting environmental values in the GBR catchment waterways and the reef lagoon.

Moving from left to right across the chart it is possible to see how the gross impact of the development is reduced via avoiding and mitigating impacts on site. However, there is still a residual negative impact from the development that is offset via a combination of a physical and financial offset. The financial offset would then become a funding source for the Reef Bank.⁵

When considering the use of a financial offset, a key question is when is it appropriate for a like-for-like physical offset to be partially substituted by a financial offset? One option would be to identify a point where the cost of achieving another unit of a physical offset increases sharply. Figure 4 shows two hypothetical cost curves to achieve environmentally equivalent outcomes for the GBR.

Figure 4: Substitutability of financial offset for physical offset



Source: MainStream Economics and Policy

In this hypothetical example, the cost of securing a physical offset is shown by the blue curve. There is a sharp increase in the marginal cost of securing a physical offset beyond 60% of the offset requirement. That is, 60% of the total offset requirement is achieved for \$80,000, while the final 40% costs a *further* \$920,000 (i.e. the total cost of the offset requirement is \$1,000,000). If a financial offset is used to meet the final 40% of the total offset requirement (via investing in an environmentally equivalent project shown by the green curve), the total costs are reduced significantly. In effect, under a no net loss water quality offset regime, the regulatory requirement has been achieved at a significantly lower cost. Moreover, where a portion of the potential cost savings from utilising the financial offset facility is applied to purchase additional offsets, a net environmental benefit can be achieved.

The concept of financial water quality offsets could be further extended to capture relatively smaller developments to ensure a fairer and more equitable spread of the regulatory requirements across all development. This is essentially the approach adopted by Melbourne water (see text box below).

Text box 1: Melbourne Water – Stormwater Quality Offsets

A developer may make a payment to offset the residual loads that cannot be effectively or efficiently avoided on site. An example of this approach is the Stormwater Quality Offsets where, '...a financial contribution to Melbourne Water for regional water quality works is undertaken elsewhere within the catchment to offset pollution loads not treated within the development. Offsets provide flexibility for developers where best practice performance objectives cannot be achieved onsite, or where water quality works are planned as part of a

⁵ It should be noted that there are likely to be constraints on the types of suitable projects the Reef Bank could disburse funds to. For example, nutrient reduction offset funds could not be applied to a project that primarily provided sediment benefits, but no nutrient reductions. In effect, the funding stream would be tied to the broad requirements of the original offset.

drainage programme'. In this case, the offset, in conjunction with the onsite works, should result in no net increase in pollution loads attributable to the development. To implement such a policy in the GBR catchments would require amendments to existing policy. However, such an approach could make a very significant contribution to mitigating the likelihood of load growth from future development.

Source: Melbourne Water (2006) Stormwater Quality Offsets: A Guide for Developers, Melbourne Water, Melbourne

Despite the potential efficiency gains that could be achieved through the use of water quality offsets, the mechanism is not without technical, market and environmental risks. Therefore, it is vital that any development and use of water quality offsets meets the criteria outlined in Section 3.2 and that measures of equivalence, market structures and compliance measures are robust and transparent. This is vital to underpin any effective, efficient and accepted water quality offset market.

Key findings

- There are potentially significant environmental and financial gains to be made by astute use of a financial offsets facility in conjunction with physical offset requirements. A Reef Bank is an ideal method for consolidating and distributing funds raised through a financial offsets mechanism.
- Offsets are not without technical, market and environmental risks. These risks need to be effectively managed.

3.2.2 Water quality offset banking

A further extension of a water quality offsets model would be the establishment of water quality offsets banking. Under this arrangement, investors in projects that create water quality benefits (e.g. an investment in a constructed wetland) could earn credits providing specific requirements were met.

The credits created can then be sold to buyers requiring an offset. The proceeds of the sale are then available to fund the future management of the site (and potentially provide a profit for the person who created the offset credits).

Under this model, there are a number of roles that the Reef Bank could undertake, including:

- Maintaining the register of credits.
- Facilitate transactions (i.e. Reef Bank is the clearance house).
- Invest in water quality credit creation as a commercial venture.

A Reef Bank could provide a critical service in the development of a water quality offset market via credit and transaction management, and through investment in cost efficient projects that create commercially sellable credits.

Key finding

- A Reef Bank could provide a critical role in innovative water quality financing and in facilitating the use of market mechanisms such as water quality offset banking.

Recommendation

3. Further investigate how water quality offsets could be established to benefit both development and the resilience of the GBR.

3.3 Reef Bonds

Private capital markets are able to play an important role in mobilising private funding for investment into enhancing the condition and resilience of the GBR. To facilitate this flow of funds it is necessary to offer investment products that appeal to a broad range of investors.

Internationally, there is already an emerging market for bonds issued to investors where the funds raised are used as loans to finance commercially viable projects that also provide environmental benefits. These are typically called 'Green Bonds' - a fixed income product that offers investors the opportunity to participate in the financing of 'green' projects. Green Bonds have similar features to regular bonds and have significant appeal to investors who wish to incorporate socially responsible investments into their investment portfolio (Euromoney, 2010).

A similar type of bond product could be established to raise capital to invest in projects across the GBR that are commercially viable *and* deliver benefits to the GBR – 'Reef Bonds'. It is estimated that the responsible investment sector accounts for around 18% of the total assets under management in Australia, with a market value of \$180 billion (RIAA, 2013). Internationally, it is estimated the total portfolio of investments in sustainable projects is around USD14.6 trillion (GSIA, 2012).

Key finding

- The responsible investment market in Australia is worth approximately \$180 billion. Little has been done to tap into this market to access private capital for projects that are commercially viable and enhance GBR resilience.

In recent years, new private corporate bond issues to raise funds have typically exceeded \$10 billion per annum, even in the post GFC environment (AFMA, 2012). Given the investment market appetite for sustainable investments, the iconic nature of the GBR, and the likely existence of a pipeline of commercially viable projects in the GBR that would also enhance GBR resilience, it would be prudent to investigate the market potential of Reef Bonds in more detail.

Recommendation

4. Investigate the market potential of Reef Bonds in more detail.

3.4 Other sources of funds

MainStream Economics and Policy has identified a number of other sources of funds that could be relevant to any Reef Bank, particularly where a Reef Bank could extract better value for money from investing those funds in water quality and GBR resilience. These are briefly outlined below.

3.4.1 Developer charges

Developer charges are a common approach applied by Local Governments and infrastructure service providers to recover the costs of service provision up-front at the time of development, rather than over a longer timeframe. Developer charges, if set efficiently, should at least cover the direct forward-looking costs of abating water pollution loads. Funds would then be invested in pollution abatement. It should be noted, however, that developer charges are a contentious issue and have recently been capped.

3.4.2 Licence fees

Licence fees are currently charged by the State Government for specific Environmentally Relevant Activities (ERAs) (e.g. wastewater treatment plants) based on the scale and type of load.⁶ Funds raised from these fees are treated as a revenue item by the State and the funds raised generally only cover the cost of administering the compliance regime for ERAs. Little, if any, of the funds raised are actually spent on pollution mitigation projects. However, while it would be possible to amend the licence fees system to raise further revenue, setting an efficient price is problematic under the existing Queensland regime as fees are not based on

⁶ For an overview of fees see: http://www.nrm.qld.gov.au/services_resources/item_list.php?category_id=248

actual loads emitted. Nonetheless, where fees are set to reflect the external cost of the activity, they could provide a source of funds for the Reef Bank.

3.4.3 Efficient pollution charging

Efficient pollution pricing and associated charges are another potential source of revenue to fund pooled investment in waterway health. For example, the load-based licensing (LBL) scheme in NSW sets limits on the pollutant loads emitted by holders of environment protection licences, and links licence fees to pollutant emissions (NSW EPA, 2011).

The price signal of an LBL system is generally more efficient than that used in Queensland under the existing licence fee regime for ERAs. However, setting efficient prices based on costs of remediation is difficult.

3.4.4 Budget appropriations

The current default option for much of the funding applied to the GBR is budget appropriations from consolidated revenue (irrespective of level of Government).

This has the advantage of administrative simplicity, as no new funding mechanism needs to be established for the funded actions. However, this option has significant risks, particularly in tight fiscal environments. Budget appropriation may nonetheless be a legitimate source of funds for any Reef Bank; particularly initially until greater levels of private capital can be secured.

3.4.5 Catchment management and environmental levies

Catchment management and environmental levies target residents living within a catchment for a financial contribution, which is used for actions that improve waterway health prioritised at a catchment level. The levies are often collected by Local Government through property rates and are common across councils (e.g. Mackay Regional Council). Levies have the advantage of beneficiaries paying for actions within their own catchment; but in the absence of a consistent regime across the GBR catchments, applying levies to pooled investment could be constrained.

The Reef Bank provides a mechanism for funds raised through local catchment and environmental levies to be mobilised across Local Government borders to achieve efficient investment at a regional scale.

3.4.6 Adjustments to bulk water charges

Many water service providers impose a modest catchment management charge as part of their water service charges (IPART, 2001). This reflects that catchment management can enhance waterway health and water quality, providing commercial benefits largely from avoiding input costs. Benefits include:

- lower treatment costs due to less need for chemical inputs (e.g. alum and flocculating agents) to meet drinking water standards;
- mitigating loss of storage volumes attributable to sedimentation; and
- potentially delaying, or avoiding, costs associated with infrastructure augmentations, such as new capital expenditure on water treatment plants to maintain potable water quality.

It should be noted that this resourcing option is not currently utilised in the GBR. If this option was used, a Reef Bank could enhance the use of funds.

3.4.7 Nature-based tourism levy

The nature-based tourism sector is a major beneficiary of a healthy GBR. The Great Barrier Reef Marine Park Authority's (GBRMPA) Environmental Management Charge provides one

way for beneficiaries of a healthy GBR to contribute to the GBR's management. These levy funds, however, are currently channelled into GBRMPA.

3.4.8 Philanthropic funding

Philanthropic donations by individuals and businesses are another source of funding, albeit a relatively small source based on recent trends. However, as businesses become more attuned to corporate social responsibility (CSR) issues, and as investors increasingly value CSR, opportunities for philanthropic funding options will also increase. These sources of funding have the advantage that recipient organisations, such as regional NRM bodies, are registered charities and donations are therefore tax deductible.

A Reef Bank may provide an attractive option for philanthropic funding in Australia.

Key finding

- There are multiple sources of potential funds that could be managed by a Reef Bank (see Sections 3.2 to 3.4). However, most of these sources are partially or fully reliant on Government investment.

3.5 Options

The key option for any Reef Bank to consider is whether to pursue existing funding sources only, or actively seek to tap into new sources of funding such as financial water quality offsets or Reef Bonds (that could theoretically fund any commercially viable project to enhance GBR resilience).

Without actively seeking to expand the scope and scale of investment in GBR resilience, as well as ameliorating other threats to the Reef, it is only rational to expect the decline in GBR condition to continue. Therefore, it is absolutely crucial that innovative funding sources are pursued, and a Reef Bank, if established, could be a valuable instrument for this.

Recommendation

5. If a Reef Bank is to be successful, it is absolutely crucial that innovative funding sources, such as financial water quality offsets or Reef Bonds, be pursued.

4 Funds management function

The funds management function of a potential Reef Bank is central to its efficient and effective operation. This section briefly outlines and discusses this function.

4.1 Governance requirements

Robust management of environmental investment funds requires governance arrangements that are appropriate, both for decision-making and financial management. While governance for broader decision-making is outside the scope of this project, governance relating to management and acquittal of pooled financial investment and lending is within the scope. There are a number of requirements that should be met to ensure robust governance. These are outlined in Table 4.

Table 4: Key governance requirements

Description	Comments and notes
Clear purpose	A clear and unambiguous purpose is fundamental to good governance. The purpose of the funding and investment is clear — to ensure maximum value-for-money improvements in waterway health and GBR resilience from the use of the funds available.
Independence and accountability	The financial governance should be independent of undue influence and should be accountable to investors for investments made on their behalf.
Relevant expertise	Any staff or individuals performing governance oversight roles on behalf of investors should be appropriately skilled.
Operating surpluses reinvested	Unlike typical banks, the objective of the Reef Bank is not to maximise profits and distribute profits to shareholders. The objective is to ensure best value-for-money from investments in on-ground waterway enhancement projects. This includes the distribution of non-repayable funds and the provision of loans to worthy projects.
Low administrative overheads	Administrative overheads for on-ground project assessment and selection should be undertaken by officers with the required skills in science, economics, and finance. Administrative overheads for the investment and financial governance could be minimised by using an appropriate third party. Given the nature of Reef Bank, there may be opportunities for established financial institutions to host administrative functions at little or no cost to Reef Bank as part of their CSR activities.
Commercial transaction approach	All transactions, whether for non-repayable or repayable disbursements, should be underpinned by legally enforceable contacts to ensure appropriate performance and financial protection for all contracted parties.
Appropriate accounting and financial reporting	Accounting and reporting should be consistent with appropriate accounting and financial reporting standards. Given that some on-ground projects may require transactions over several years, future assets and liabilities will need to be accounted for correctly.
Appropriate regulatory approvals	All necessary accounting, Financial Management Act, Tax Act and ASIC regulatory requirements will need to be met.
'Deductible Gift Recipient' tax status for voluntary contributions	While much initial funding is likely to be sourced from public sources and (potentially) via regulatory requirements (e.g. from offset contributions), it should be the intention that, in the longer term, a proportion of the funding should be from private sources. Ideally the investment fund should achieve Deductible Gift Recipient status with the Australian Taxation Office. This status would allow private sector

	<p>donors to use the deduction allowances, encouraging greater levels of investment.⁷</p> <p>The purpose of any fund should be consistent with the requirements of environmental organisations eligible for concessional tax arrangements. The Australian Taxation Office require environmental organisations whose: 'principal purpose must be protecting and enhancing the natural environment or a significant aspect of it, providing information or education, or carrying out research about the natural environment or a significant aspect of it.'⁸</p>
Recognise and manage risks	<p>The overall governance framework will need to mitigate technical, administrative, landholder compliance, and political risk. Financial risks can be significantly mitigated through the use of appropriately skilled and experienced funds administrators.</p>
Linking with other governance arrangements	<p>The governance arrangements for the investment fund should be linked and complementary to other relevant governance arrangements. The financial governance arrangements are essentially 'stand-alone', which ensures the independence investors seek, while they enable the decision making (i.e. prioritisation of investments, on-ground monitoring, and overall monitoring and evaluation) to be managed via existing processes where possible.</p>

Source: MainStream Economics and Policy analysis based on: Principles of Good Corporate Governance and Best Practice Recommendations (ASX Corporate Governance Council, 2003), Governance Arrangements for Australian Government Bodies (Department of Finance and Administration, 2005), ASIC (2010) Regulatory Guide 203 – Do I need a credit licence?

Key finding

- While governance requirements are significant, they are not onerous relative to the potential benefits of a Reef Bank.

4.2 Operational and administrative functions

The scope, number and complexity of potential functions to be undertaken by any Reef Bank can be considerable; ranging from marketing to meeting statutory regulatory requirements. A Reef Bank's functions may include:

- Marketing of products and services.
- Taking deposits and contributions of funds.
- Making disbursements via multiple mechanisms, including loans.
- Paying interest on interest-bearing securities and charging interest for loans.
- Acting as a consolidator of funds and facilitate efficient investment in projects.
- Working cooperatively with other relevant stakeholder organisations to ensure investments facilitated via the Reef Bank are consistent with broader institutional arrangements and provide cost effective enhancements to the GBR's resilience.
- Where necessary, working across multiple products and approaches (e.g. offsets and bonds) and across sectors.
- Maintaining all necessary commercial contract and ICT systems.
- Managing funds on behalf of relevant parties in a transparent and legal manner.

⁷ It is not necessary that the whole organisation achieves Deductible Gift Recipient status. Rather, only the fund needs to be registered.

⁸ www.ato.gov.au/nonprofit/content.aspx?menuid=0&doc=/content/30675.htm&page=2&H2. Accessed 21 August 2011.

- Maintaining sufficient staff capacity.
- Managing all relevant assets and liabilities, ensuring liquidity and the ongoing commercial viability of the Reef Bank.
- Undertaking administrative functions, such as reporting and meeting regulatory requirements.

These functions are too many and varied for detailed coverage within the scope of this Report. However, necessary functions will need to be fully identified and scoped as part of any subsequent stages in assessing the feasibility of a Reef Bank.

Recommendation

6. Detailed identification and scoping of Reef Bank functions should be undertaken as the next phase of any feasibility assessment of the Reef Bank.

4.3 Options

There are a number of options that need to be considered. An initial assessment of key options is outlined below.

4.3.1 Initial corporate and institutional architecture

There are two main options. Is it best to:

- Establish a stand-alone institution capable of fulfilling all of the functional requirements of the Reef Bank? or
- To the extent possible, tap into the capacity, resources and systems of existing institutions?

Establishing a stand-alone institution from scratch is timely and expensive. This could unnecessarily delay achieving any benefits of the Reef Bank and result in significant costs without any guarantee of success.

There are already multiple institutions that currently undertake (or have the ability to undertake) many of the likely functions of the Reef Bank. Existing institutions (such as commercial banks) may be willing to undertake many of the functions at little or low cost as part of their CSR and ethical investment activities. Where these opportunities are available, they should be utilised.

Recommendation

7. Options to achieve the functionality and objectives of Reef Bank without the need to establish a large governance structure are more appropriate until the concept has proven its worth.

4.3.2 Scale and risk management

This is a relatively untested approach to environmental financing; little is known about the appetite of investors for Reef Bonds, the demand for loans, and the potential for use of water quality offsets. In short, the scope and scale of a Reef Bank is not sufficiently understood to establish a major entity in the short term.

Policy, environmental, and market risks could be significantly mitigated though the initial establishment of the Reef Bank as a pilot project (and entity). This pilot could be relatively modest and tap into, and complement, existing investment and programs (e.g. Reef Rescue) as well as trial new mechanisms (e.g. a small-scale Reef Bond backed by a Government guarantee). Any pilot should be accompanied by a robust monitoring and evaluation programme to demonstrate: the worth of the Reef Bank; the demand for its services; and risks and improvements to be addressed before Reef Bank becomes a permanent policy and commercial entity.

Recommendation

8. Given uncertainties regarding the demand for Reef Bank services and functions, a pilot trial in conjunction with a robust evaluation would be appropriate before going to a large scale application.

5 Disbursement function

The final key function of the Reef Bank would be the disbursement of funds in an effective and efficient manner to ensure investment makes a material contribution to enhancing the resilience of the GBR. Disbursement could be undertaken via a number of mechanisms (e.g. grants, reverse tenders and other market-based instruments,⁹ or loans). One key distinction of these funds distribution approaches is whether the recipient (e.g. a landholder) is required to pay back the funds or not. This section briefly outlines potential disbursement approaches under two broad headings – non-repayable funds, and loans.

5.1 Non-repayable funds

One key function of the Reef Bank would be to ensure that any funds received that were to be channelled into projects that did not require repayment by recipients, should be invested in projects that provide value for money.

5.1.1 Principles for disbursement – non-repayable funds

There are a number of principles that should underpin the disbursement of non-repayable funds under the Reef Bank. These include:

- All projects must make a positive contribution to enhancing the resilience of the GBR.
- Funding is most appropriate for projects with a significant public good component, and where there are insufficient private incentives to justify full private funding. In effect, moral hazard should be avoided.
- Funding should be allocated based on the relative cost effectiveness of projects. This includes consideration of expected environmental change attributable to the project, and the lifecycle cost of the project.
- Metrics and other measures of environmental equivalence will be needed to underpin assessments, and ensure transparency and repeatability of assessment processes.
- In assessing projects, consideration should be given to any constraints imposed on investors, funding bodies, or by regulatory requirements. For example, where funds originated from a regulated water quality offset requirement, the funded project will need to meet those offset requirements (e.g. environmental equivalence criteria are met).
- All funding should be underpinned by suitable contractual arrangements.
- Discriminative funding mechanisms, such as reverse tenders, may be preferable to fixed cost-sharing arrangements as they have a lower risk of over/under payment for actions undertaken.
- The Reef Bank is likely to need to work in conjunction with multiple parties to deliver effective and efficient funding. This includes utilising relevant scientific, economic and commercial expertise to deliver funding.

Key finding

- Fund disbursement should be underpinned by sound scientific, economic and commercial principles.

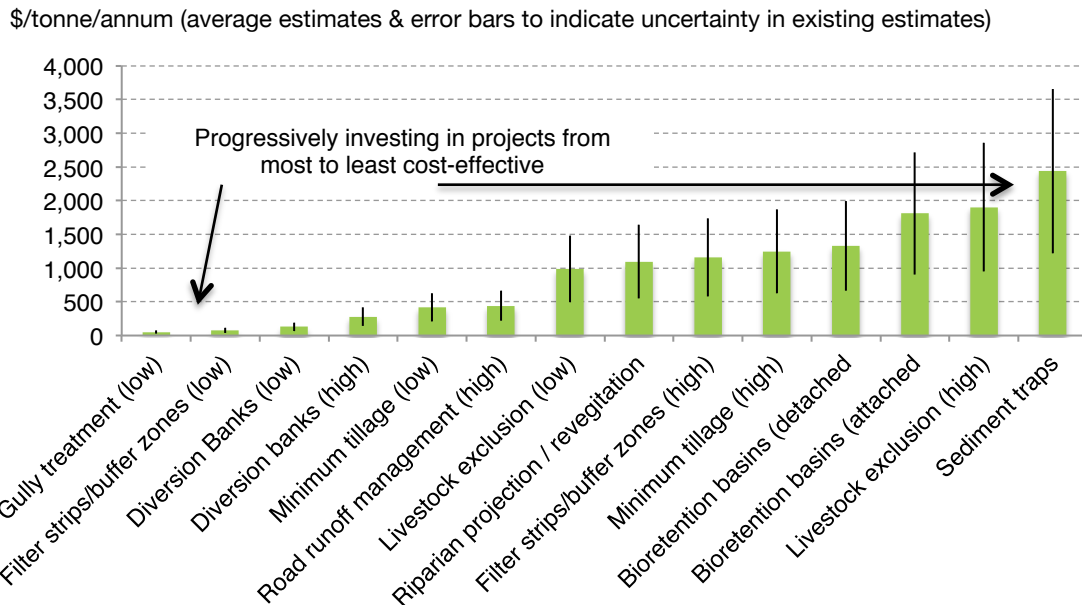
5.1.2 Prioritisation based on cost-effectiveness

Prioritisation of funding should be based on the principal of cost-effectiveness. This ensures that maximum benefits are derived from a given pool of investment. An example of this approach is shown in Figure 5 for sediment abatement costs (\$/tonne/annum). The key point

⁹ For an overview of different types of market-based instruments, see: <http://www.marketbasedinstruments.gov.au>

to note is that there is a significant degree of variability in cost effectiveness, providing significant scope for enhancing the efficiency of investment.

Figure 5: Indicative sediment abatement costs



Source: MainStream Economics and Policy analysis

Similarly, there is significant variance in pollution abatement cost between geographically different regions. For example, for nitrogen abatement on the Wet Tropics, sugar cane best management practices are significantly more cost effective than urban diffuse or point source solutions. This provides significant opportunities to gain from funding low cost options – potentially funded by entities that only have direct access to high cost options.

Table 5: Relative costs of water pollution abatement - nitrogen

Source	Approximate costs (\$/kg/annum)
Rural diffuse – cane best management practices	-\$31 - +38
Urban diffuse – water sensitive urban design	\$360 - 450
Point sources – wastewater treatment plants	\$76 - 200

Source: Binney, J, Austin, A., Tunny, G, Prickett, K, and Fitzgibbons, A (2013) Report on the economic and social impacts of protecting environmental values in the GBR catchment waterways and the reef lagoon.

Recommendation

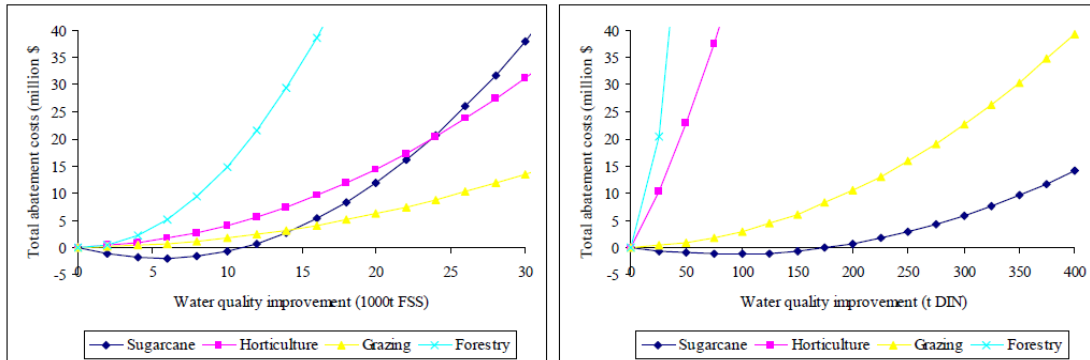
- There is significant evidence to suggest that there are high levels in variability of pollution abatement costs across the GBR catchments. This indicates that prioritisation of funding based on cost-effectiveness principles could provide significant efficiency gains.

5.1.3 Possible multiple approaches for a single pollutant

It is also possible that funding could be used in conjunction with other interventions. For example, analysis undertaken by CSIRO in the Tully-Murray catchment found significant variance in costs of pollution abatement both within *and* between sectors (see Figure 6). This suggests the packaging and sequencing of efficient policies in conjunction with funding mechanisms can deliver major gains in the efficiency of meeting pollution abatement targets. In the Tully Murray Water Quality Improvement Plan, by targeting ‘win-win’ outcomes for sugar producers first, and then targeting the low-cost abatement from sugar and grazing, nutrient targets could be achieved at about half the cost of the lowest single-industry option.

Given the need for multiple interventions and industries to work seamlessly to achieve the greatest efficiencies in investment, the Reef Bank will need to work closely with, and sometimes through, stakeholder organisations (e.g. regional NRM bodies, industry bodies etc.).

Figure 6: Progressively invest up the abatement cost curve



Source: Roebelling, et al, 2007. Environmental-economic analysis for exploration of efficient land use and land management arrangements, water quality improvement targets and incentives for best management practice adoption in the Tully–Murray catchment. CSIRO.

Key finding

- To ensure maximum value for money from available funding, the Reef Bank will need to work closely with, and sometimes through, stakeholder organisations.

5.2 Lending

There are significant opportunities for investing in “win-win” projects across the GBR, where the project or program delivers commercial returns *and* enhances the resilience of the GBR. Many of these projects, however, fall outside the usual lending guidelines for most traditional financial institutions. Hence, access to financial capital can be a significant impediment to undertaking “win-win” projects.

There is a significant opportunity for the Reef Bank to undertake prudent lending as a key component of its functions. In effect, acting as a lender and providing loans for commercial projects can have a number of positive impacts, including:

- Funding can be made available to projects that may not be eligible under current programs.
- It enables the spreading of costs for projects over a longer timeframe. This is particularly important for long term projects with high upfront capital costs.
- It can draw in other private sector financing, particularly for projects and project types that are perceived to be too complex or too risky for traditional financial institutions. Over time, these projects will become more mainstream and investor appetite for the projects will increase.
- As loans for “win-win” projects become more common, it should gradually reduce the reliance on Government to fund environmental change.

As with any loan, the funds would be provided under a commercial contract and accrue interest charges. There is already some precedent for large-scale loans for environmental projects and the establishment of innovative institutions to underpin their financing (see case study below).

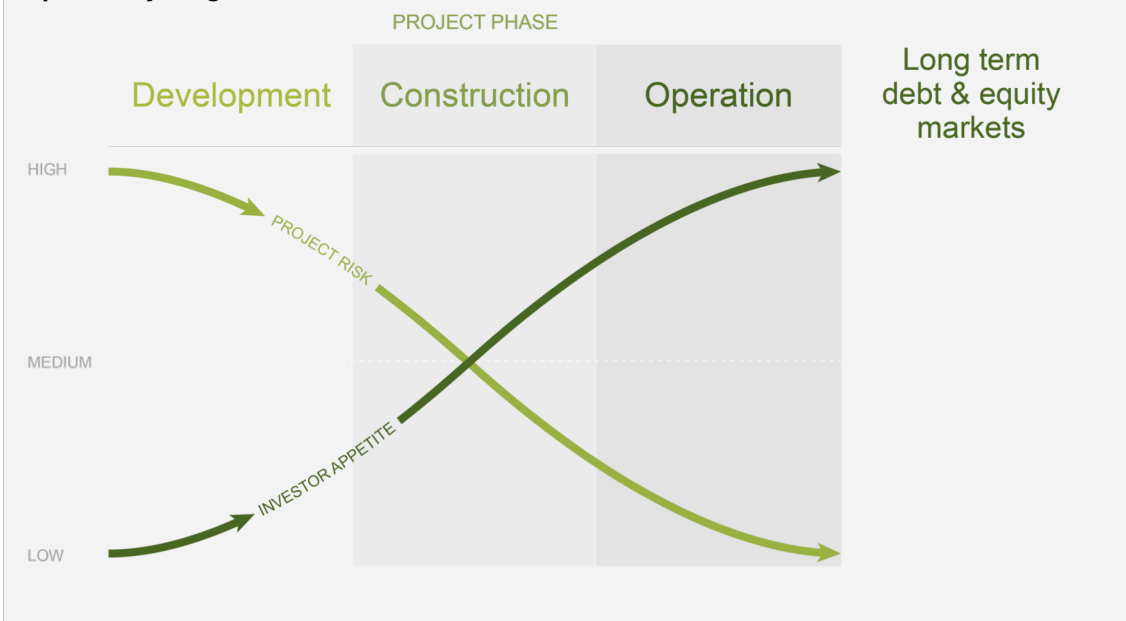
Text box 2: The Green Investment Bank

The Green Investment Bank (GIB) commenced operations in October 2012 with £3 billion in UK taxpayer capital. The objective of the GIB is to accelerate the UK's transition to a more green economy, and create an enduring financing institution for green projects, operating independently of Government.

GIB invests in UK projects that are both green and commercial. Capital provided is generally "additional" to available private sector finance. One of the objectives of the GIB is to provide partial financing to projects (in conjunction with other private sector investors) to projects that are outside the norm for mainstream financial institutions. In effect, GIB crowds in finance from the mainstream capital markets into green projects through sharing investor risk and exposure.

Furthermore, GIB is able to provide finance to projects with green credentials until the commercial viability of the project is proven. From this point ongoing finance can be provided by the mainstream capital and financing markets. This is called capital recycling.

Capital recycling



The intent is that the GIB will be run for profit, with profits reinvested into the business to cover

Source: See www.greeninvestmentbank.com/default.html

5.3 Options

There are two key options relating to funds disbursement for the Reef Bank. Firstly, how funds are to be distributed – single or multiple approaches. Secondly, whether the Reef Bank should operate independently or in conjunction with other relevant parties.

5.3.1 Single or multiple approaches to distribute funds?

There are two broad options for fund distribution:

- utilise a single approach for all circumstances, or
- use multiple approaches based on specific circumstances.

While the first approach is relatively simple and has low administrative costs, evidence suggests that the design and requirements of funding can have a significant impact on participation, cost sharing, and ultimately the return on investment.

Recommendation

10. Multiple fund distribution approaches are required to ensure investment into the GBR's resilience is maximised. This necessarily includes loans for "win-win" projects where appropriate access to capital is the constraining factor on actions.

5.3.2 Operate independently or collaboratively?

The second option to consider is whether the Reef Bank should work in isolation or in conjunction with other relevant parties when distributing funds. Lessons from programs such as the Commonwealth Environmental Stewardship Program and Tasmanian Forest Conservation Fund (Binney and Whiteoak 2009, 2010) suggest that significant cost efficiency gains are possible by working in collaboration with well-established organisations. This includes enhanced participation, cost sharing and administrative efficiencies.

In addition, there are circumstances where funding or loans should be used in conjunction with other interventions and policy instruments (e.g. extension, offsets etc.). This provides a further rationale for a Reef Bank to work collaboratively with other relevant parties to maximise the benefits and efficiencies of the Reef Bank's activities.

Recommendation

11. The Reef Bank should actively seek out partners and collaborative arrangements to ensure funds are distributed in an effective and efficient manner.

6 A way forward

As outlined in Figure 7, there are three logical and interconnected phases that must be completed before an informed decision can be made whether or not to proceed with the Reef Bank as a permanent policy and commercial entity. These phases are: (1) detailed feasibility and business case design; (2) detailed feasibility and business case; and (3) real-world pilot. This section briefly outlines each of these phases.

6.1 Phase 1: Detailed feasibility and business case design

The objective of Phase 1 is to build on the current report by identifying, scoping and designing a detailed analysis of the research projects required to develop a robust feasibility study and business case. Phase 1 will also provide more detail about the need for, and potential benefits of, a Reef Bank. This Phase should be able to be completed within six weeks of project commencement and will require a budget of approximately \$20,000.

6.2 Phase 2: Detailed feasibility and business case

The objective of Phase 2 is to undertake a detailed analysis of the key issues associated with the establishment of a Reef Bank, as well as make recommendations on optimal structure and design. This Phase consists of five interrelated studies that ultimately form the detailed feasibility and business case. These five studies each fall under one of the three key functions of the Reef Bank (fund consolidation, fund management, and fund disbursement) and will require the services of an interdisciplinary team of expert researchers.

Due to the interrelated and interdisciplinary nature of the five studies, MainStream Economics and Policy suggest that a single entity be appointed to coordinate and manage this Phase. The appointed entity should have the ability to draw on the expertise of researchers from a wide range of disciplines, including economics, finance, law, science and public governance.

In order to be ready for the 2014/15 financial year, Phase 2 will need to be completed within six to nine months of project commencement. This Phase will require a total budget of approximately \$210,000, including \$10,000 for project coordination and management.

The five studies (or research projects) are as follows:

- Research Project 1: A detailed review and analysis of current (and potential future) funding sources. This would determine the likely demand and availability of funding from new sources – particularly private sector capital. This will be a very detailed desktop review of existing funding, coupled with semi-structured interviews of key stakeholders (e.g. commercial financiers) to assess potential future sources of funding. This project will require a budget of approximately \$55,000.
- Research Project 2: A best practice review of comparable mechanisms employed elsewhere. This will be a desktop review of all comparable mechanisms employed nationally and internationally, with a view to drawing key lessons that can be applied in the development of the Reef Bank. This study would on the findings outlined in this report. This project will require a budget of approximately \$15,000.
- Research Project 3: The development of appropriate governance structures. Based on the findings of Research Project 2, this project will investigate the optimal governance and corporate structure for the Reef Bank. This project would also establish a detailed budget to establish and run Reef Bank. This project will require a budget of approximately \$50,000.
- Research Project 4: An assessment of the likely demand for funding from the Reef Bank. This project will employ a desktop review, semi-structured interviews and stakeholder surveys to review the level of demand for, and scope of, all existing programs. This information will be used to estimate potential levels of demand for funding from the Reef

Bank (e.g. is the pipeline of potential projects \$5 million per annum, or \$50 million?). This project will require a budget of approximately \$50,000.

- Research Project 5: A detailed analysis of fund disbursement options and mechanisms. This will include analysis of the scope to use grants, semi-commercial loans and fully commercial loans to disburse funds, as well as an analysis of appropriate allocation mechanisms. This will also determine the means by which scientific expertise and modelling are combined with commercial data to assess individual projects and programmes targeted by Reef Bank investment. This project will require a budget of approximately \$30,000.

6.3 Phase 3: Real-world pilot

In order to manage for long-term market and policy risk, it will be prudent to run a real-world pilot of the Reef Bank. This could be run over three years, with the initial capital injection potentially coming from the same source as other on-ground GBR funding initiatives (they are essentially substitutes - the difference being that a Reef Bank would see the capital funding recycled over time). Phase 3 consists of three sequential tasks:

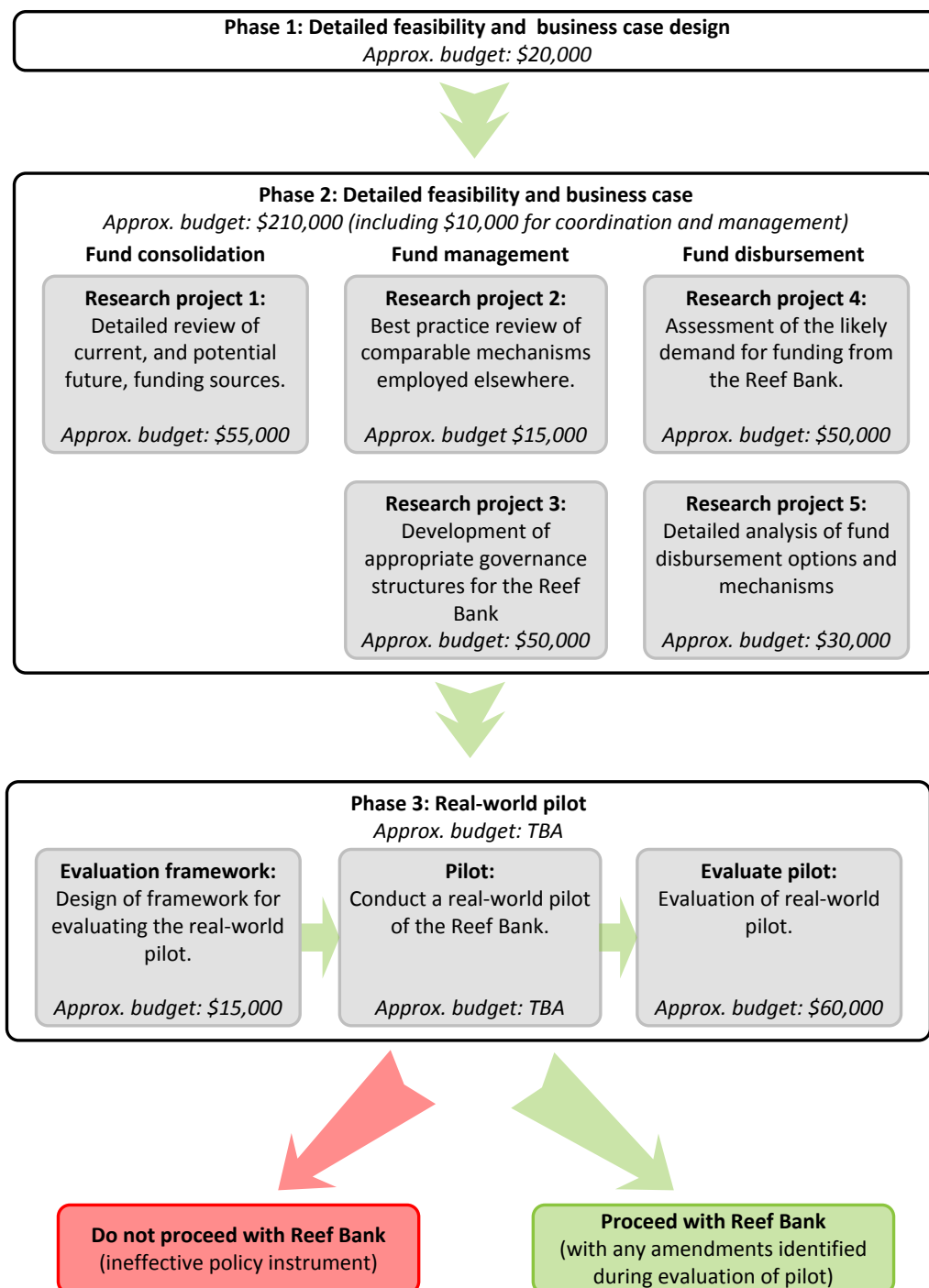
- Task 1: Design a framework against which to evaluate the success (or otherwise) of the real-world pilot. This task will require a budget of approximately \$15,000.
- Task 2: Conduct a real-world pilot. That is, establish and run the Reef Bank for a predetermined period of time. The budget for this task is yet to be determined.
- Task 3: Evaluate real-world pilot: This involves employing the evaluation framework designed in Task 1 to evaluate the performance of the Reef Bank. The evaluation will include benchmarking the cost effectiveness of the Reef Bank against other approaches. On completion of this task, an informed decision will be able to be made as to whether or not it is prudent to proceed with the establishment of the Reef Bank as a permanent policy and commercial entity. The budget for this task is approximately \$60,000.

6.4 Next step

The immediate next step is to commission Phase 1: Detailed feasibility and business case design. As indicated above, this will require a budget of approximately \$20,000 and should be completed within six weeks of project commencement. If the Reef Bank real-world pilot is to be ready for the 2014/15 financial year, this Phase must be commissioned and completed as soon as possible.¹⁰

¹⁰ MainStream Economics and Policy have identified Griffith University's Industry Collaboration Scheme as a potential means of co-funding Phase 1. This requires MainStream Economics and Policy, and/or WWF to act as industry partners to Griffith University's Social and Economic Research Program (SERP). Under the Scheme, Griffith University will provide \$10,000 towards completion of the project, as long as there is a matching commitment from the industry partners (consisting of at least \$5,000 cash and \$5,000 in-kind). Note that the purpose of the Scheme is to drive the development of larger scale applications to external industry-linked grant schemes (in this case, an application to seek funding to undertake Phase 2).

Figure 7: Phases to implement Reef Bank



Source: MainStream Economics and Policy

References – cited in text

- Access Economics Pty Limited (2009) Measuring the Economic and Financial Value of the Great Barrier Reef Marine Park. Great Barrier Reef Marine Park Authority, Townsville, QLD
- AFMA (2012) Australian Financial Markets Report
- Australian Government (2012) Fact sheet – The Great Barrier Reef World heritage Area
- Australian Government, Queensland Government (2013) Great Barrier Reef. Second Report Card 2010 Reef Water Quality Protection Plan
- Binney, J., and Whiteoak, K. (2009) Major review of the Tasmanian Forest Conservation Fund, for the Commonwealth Department of Environment, Water, Heritage and the Arts. 2009
- Binney, J., and Whiteoak, K. (2010) Review of the Environmental Stewardship Program, for the Commonwealth Department of Environment, Water, Heritage and the Arts. 2009
- Binney, J. (2010) The economic and social impacts of protecting environmental values in the Great Barrier Reef catchment waterways and reef lagoon. Marsden Jacob Associates for the Department of Environment and Resource Management, Brisbane, Australia
- Binney, J., Austin, A., Tunny, G., Prickett, K. and Fitzgibbons, A. (2013) Report on the economic and social impacts of protecting environmental values in the GBR catchment waterways and the reef lagoon
- Brodie, J., Binney, J., Fabricius, K., Gordon, I., Hoegh-Guldberg, O., Hunter, H., O'Reagan, P., Pearson, R., Quirk, M., Thorburn, P., Waterhouse, J., Webster, I. and Wilkinson, S. (2008) Synthesis of evidence to support the Scientific Consensus Statement on Water Quality in the Great Barrier Reef
- Eisner, R, Le Grand, J & Norman, P. (2007) A Water Quality Metric for the Great Barrier Reef Catchments, Department of Natural Resources and Water, Brisbane.
- Euromoney (2010) The Euromoney Environmental Finance Handbook
- GSIA (2012) Global Sustainable Investment Review
- Kragt, M., Roebeling, P. and Ruijs, A. (2009) Effects of Great Barrier Reef degradation on recreational reef-trip demand: a contingent behaviour approach, The Australian Journal of Agricultural and Resource Economics Vol. 53, 213-239
- Melbourne Water (2006) Stormwater Quality Offsets: A Guide for Developers, Melbourne Water, Melbourne
- NSW EPA (2001) Load-based Licensing - A Fairer System that Rewards Cleaner Industry
- Oxford Economics (2009) Valuing the effects of Great Barrier Reef Bleaching. Report prepared for the Great Barrier Reef Foundation. Australia
- RIAA (2013) RIAA Window – Issue 31, 15 February 2013
- Roebeling, P., van Grieken, M. and Webster, A. (2007) Environmental-economic analysis for exploration of efficient land use and land management arrangements, water quality improvement targets and incentives for best management practice adoption in the Tully-Murray catchment, CSIRO
- Rolfe, J., Windle, J., Muller, C. and Greiner, R. (2007) Designing a metric for conservation tenders at different levels of scope and scale, Using Conservation Tenders for Water Quality Improvements in the Burdekin Research Report 3, Central Queensland University, Rockhampton.
- The World Bank (2012a) Green Bond Fact Sheet
- The World Bank (2012b) Green Bonds – Fourth Annual Investor Update

Other references

- ABS (2002) 4603.0 Environment Protection Mining and Manufacturing Industries, Australia
- ABS (2008) 4620.0 Natural Resource Management on Australian Farms, 2006-07
- ABS (2012) 5625.0 Private New Capital Expenditure and Expected Expenditure, Australia
- ABS (2013) 5625.0 Private New Capital Expenditure and Expected Expenditure, Australia
- Amanda Cornwall & Associates (forthcoming) Reef Rescue Effectiveness Study
- Aretino, B., Holland, P., Matysek, A. and Peterson, D. (2001) Cost Sharing for Biodiversity Conservation: A Conceptual Framework, Productivity Commission Staff Research Paper, AusInfo, Canberra
- ASIC (2009) Investing in Corporate Bonds
- ASIC (2010) Regulatory Guide 203 – Do I need a credit licence?
- ASX (2003) ASX Corporate Governance Council - Principles of Good Corporate Governance and Best Practice Recommendations
- ASX (2013) Understanding Interest Rate Securities
- Australian Ethical Investment Limited (2012) Directors' Report for the year ended 30 June 2012
- Australian Government (2012b) Commonwealth Budget papers 2012-13
- Australian Government (2012c) State Party Report on the State of Conservation of the Great Barrier Reef World heritage Area (Australia)
- Binney, J. (2007) Economic investigation into the benefits and costs of environmental offsets, for the Queensland Environmental Protection Agency. 2007. Marsden Jacob Associates for the Department of Environment and Resource Management, Brisbane, Australia
- Binney, J. and James, D. (2012) Sharing the Load: A collaborative approach to investing in South East Queensland's waterways
- Black, S., Kirkwood, J., Rai, A. and Williams, T. (2012) RBA Research Discussion Paper - A History of Australian Corporate Bonds
- Cranford, M., Henderson, I., Mitchell, A., Kidney, S. and Kanak, D. (2011) Unlocking Forest Bonds: A High-Level Workshop on Innovative Finance for Tropical Forests, Workshop Report. WWF Forest & Climate Initiative, Global Canopy Programme and Climate Bonds Initiative
- DEC (2005) Green Offsets for Sustainable Regional Development: ID16 Final Report, National Market-Based Instruments Pilots Program, Department of Environment and Conservation NSW and Action Salinity and Water Australia, Sydney South
- DECC (2006) Hunter River Salinity Trading Scheme: Working Together to Protect River Quality and Sustainable Development, Department of Environment and Climate Change NSW, Sydney South
- DECC (2007) Biobanking: Biodiversity and Offsets Scheme, Scheme Overview, Department of Environment and Climate Change NSW, Sydney
- Deloitte Access Economics (2011) Queensland Resources Council Queensland Resource Sector State Growth Outlook Study
- Dench, C. and Trendell, P. (2011) Performance Story Report 2 - Evaluation of Investment in the Reef Catchments Reef Rescue Project
- Department of Finance and Administration (2005) Governance Arrangements for Australian Government Bodies

- Department of Sustainability, Environment, Water, Population and Communities (2012) Annual report 2011-12
- Gillard, G. (2013) Landholders and Farmers Given Support to Protect the Great Barrier Reef (press release 24 April 2013)
- Hancock Prospecting Ltd (2010) Alpha Coal Project Environmental Impact Assessment
- IPART (Independent Pricing and Regulatory Tribunal) (2001) Department of Land and Water Conservation: Bulk Water Prices, from 1 October 2001, Determination No 3 2001, Sydney.
- Marsden Jacob Associates (2007) Economic benefits and costs of environmental offsets
- MDE (2010) Maryland's Phase I Watershed Implementation Plan for the Chesapeake Bay Total Maximum Daily Load, Maryland Department of Environment
- OECD (2004) Financing Water and Environmental Infrastructure for all – Some Key Issues. Global Forum on Sustainable Development, 2004
- PE Research (2010) Feasibility Assessment of Marine Protected Areas (MPA) Sustainable Financing Mechanisms for the multi-national seascape of the Sulu Sulawesi Seas Marine Ecoregion (SSME)
- Queensland Government (2008) Queensland Government Environmental Offsets Policy
- Rolfe, J. and Windle, J. (2010) Using choice modelling to identify if values for protecting the Great Barrier Reef vary by management policy options. Paper presented at the 54th Annual Australian Agricultural and Resource Economics Society Conference, 10-12th February, Adelaide. <http://ageconsearch.umn.edu/handle/95070>
- Rolfe, J. and Windle, J. (2011) Assessing community values for reducing agricultural emissions to improve water quality and protect coral health in the Great Barrier Reef. *Water Resources Research* 47(12) art no. W12506 doi:10.1029/2010WR010355
- Shafiee, S., Nehring, M. and Total, E (2009) Estimating average total cost of open pit coal mines in Australia
- Stoekli, N., Hicks, C., Mills, M., Fabricus, K., Esparon, M., Kroon, F., Kaur, K. and Costanza, R. (2011) The economic value of ecosystem services in the Great Barrier Reef: Our state of knowledge in "Ecological Economics Reviews." Costanza, R., Limburg, K. and Kubiszewski, I. (eds.) *Ann. N.Y. Acad. Sci.* 1219: 113–133
- UNEP (2009) The Economics of Ecosystems and Biodiversity for National and International Policy Makers – Summary: Responding to the Value of Nature
- UNEP (2011) Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication
- UNEP (2012) Creating the "New Normal" – enabling the financial sector to work for sustainable development
- Water by Design (2010) Business case for best practice urban stormwater management.
- WWF (2009), Guide to Conservation Finance
- WWF (2012) WWF Policy on Biodiversity Offsets