

Acknowledgement

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ANNEX A

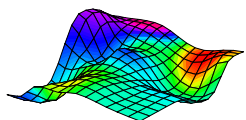
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Final report of the National Market Based Instruments Pilot Program

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The Department of Agriculture, Fisheries and Forestry, on behalf of the National Market Based Instruments Pilot Program Working Group, engaged BDA Group to collate and draw together a non-technical final report of the Program. The report draws on a number of reviews and summaries compiled throughout the course of the Program, as well as the perspectives of members of the Working Group.

Despite every effort to verify data and clarify issues raised, any remaining errors or omissions are the responsibility of the authors. Accordingly, this report does not necessarily reflect the views of the Australian Government.

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TABLE OF CONTENTS

EXECUTIVE SUMMARY	4
1 THE ROLE OF MBIs AND THE OBJECTIVES OF THE NMBIPP PROGRAM	7
1.1 Market failure and government policy instruments	7
1.2 The emerging use of market based instruments in Australia	7
1.3 Objectives of the NMBIPP	8
1.4 Components of the NMBIPP	10
1.5 The evolving environmental policy context	12
2 GOVERNANCE OF THE NMBIPP PROGRAM.....	14
2.1 The program model	14
2.2 Administrative arrangements	14
2.3 Selection processes	15
2.4 Evaluation and review	15
2.5 Summary	15
3 KEY TECHNICAL FINDINGS FROM THE MBI PROGRAM.....	17
3.1 Key technical findings from the pilot projects	17
3.2 Key findings from the Capacity Building Program	22
3.3 Uptake of program findings	23
3.4 Evaluation of program findings	26
4 POLICY IMPLICATIONS AND RECOMMENDATIONS.....	27
4.1 Key policy findings	27
4.2 Recommendations	29
REFERENCES.....	33
ACRONYMS	34
GLOSSARY	35
ATTACHMENT 1: Priorities for Round 2 projects.....	37
ATTACHMENT 2: Selection criteria for the pilot projects.....	38
ATTACHMENT 3: Summary of key pilot characteristics.....	40
ATTACHMENT 4: List of Working Group members consulted.....	41

EXECUTIVE SUMMARY

Over the last decade there has been growing interest in the use of Market Based Instruments (MBIs), that is, policy tools that create market incentives, to address natural resource management issues. This interest has been driven by a theoretical promise that these policy tools can deliver efficiency gains relative to more traditional policy approaches. The National Market Based Instruments Pilot Program (NMBIPP) was established in 2002 to test this theory and to develop the knowledge needed for the wider application of MBIs for natural resource management (NRM).

The NMBIPP was established within the National Action Plan for Salinity and Water Quality (NAPSWQ). This involved a collaborative approach across jurisdictions, with each jurisdiction contributing funding based on the NAPSWQ funding formula. Funding of \$10 million was invested in an applied research program run over two funding rounds and a capacity building program. Selection of the projects in each round was undertaken by an independent Selection Advisory Panel made up of a multi-disciplinary group of experts. The program was overseen by a National MBI Working Group made up of State, Territory and Australian Government representatives.

The program has demonstrated that MBIs are feasible tools for NRM in a number of different contexts. Tenders in particular have been found to effectively deliver greater returns for public investments in NRM than traditional grants programs. For this reason tenders are suited to the emerging NRM business model focussed on greater cost-effectiveness and accountability.

However, MBIs will not always be more cost-effective and efficient than alternative approaches. Whether they are will depend on the policy context, the particular policy or program outcomes being sought, the biophysical and socio-economic characteristics of the region as well as the design characteristics that are chosen. That is, the choice and design of MBIs is context specific – accordingly there is no ‘right’ instrument, metric or design parameters. The program has identified that MBI design involves trading-off incentive targeting with design, implementation and transaction costs. Therefore MBIs can rarely be ‘off-the-shelf’, but need to be tailored to the circumstances of the natural resource problem and the policy context of the issues faced.

Encouragingly, the program has demonstrated that there are some ‘re-usable’ design components (such as contracts and metrics) that do not need to be re-created for each MBI application, but rather can be refined to prevailing circumstances. Further investment in these components could be expected to assist more widespread uptake of MBIs.

The NMBIPP Capacity Building program has been successful in promoting awareness of MBIs, establishing a practitioner ‘community’ and making a range of tools and guidelines available. On-going investment will be needed to maintain and strengthen this community. However this in itself will not meet the needs of policy and regional NRM officers in the development of MBIs.

The understanding of MBIs and their potential policy scope remains low across key policy officers, language barriers remain and the pool of MBI expertise to draw on is small.

The current institutional arrangements supporting regionally driven NRM led to tender instruments being the primary focus of pilot projects. Assuming current institutional settings remain, future MBI capacity building at the regional level should accordingly focus strongly on tenders, while broader MBI training would be appropriate for State, Territory and Australian Government policy officers in a position to influence consideration of MBIs in policy development and review.

The structure of the NMBIPP also meant that local issues were the primary focus. Projects typically focussed on management issues in a particular catchment with regional NRM bodies seeking to test the local applicability of tenders. As a consequence, the question of whether tenders could be developed to facilitate landscape-scale change at a broader regional level and address cross-catchment priorities was not considered. The scale and scope at which tender mechanisms could operate requires further consideration.

Recommendations

The following recommendations provide the opportunity for government to achieve further gains from the NMBIPP and to continue to support the broader policy application of market based instruments in Australia.

Recommendation 1: Develop a strategy for further capacity building

It is recommended that a strategic proposal be developed to target capacity building for:

- *key government policy officers* – to increase understanding of how MBIs could better feature in policy decision making for natural resource and environmental management;
- *policy economists* - in the areas of key MBI design principles and use of techniques such as experimental economics. A key part of this strategy could be a targeted program to further develop re-usable elements of MBI design applicable to different settings;
- *regional natural resource managers* – to develop their capacity to employ tenders, training courses and the establishment of collaborative relationships is required. In particular funding is required so that the MBI web site developed under the NMBIPP can be maintained and further developed; and
- *investment in key knowledge* - the NMBIPP drew on innovative and new techniques in the field of economics. A strategic research program is needed to further develop MBIs, such as in relation to contract design, metrics and tenders for multiple environmental outcomes. Research bodies such as the Australian Research Council, Research and Development Corporations (particularly Land and Water Australia) and, subject to funding availability, CERF could be approached to consider co-investment.

The proposal should be developed by a group with an understanding of what has been achieved under the NMBIPP and with policy and technical economics expertise. Potential groups which could bring together the necessary skills include:

- the existing NMBIPP Working Group;
- a new sub-committee under NRPPC; or
- outsource the development of the strategy.

Recommendation 2: That NRPPC note the implications of current institutional arrangements in limiting MBI application

The Program focussed primarily on tenders due to a number of factors. The most significant of these factors was the institutional setting for regional NRM delivery. Regional NRM bodies generally do not have the powers to impose liabilities on fellow landholders (such as charges, offsets, tradeable permits) nor the desire relative to grant-based approaches.

For this reason, the primary type of MBI that regional bodies are likely to consider will be tenders. These approaches rely on 'contract based' change, with the regional bodies purchasing environmental outcomes from landholders. Notably however, uncertainty in continued funding has limited contracting to shorter terms and constrained program continuity.

It is recommended that NRPPC note the policy finding of the NMBIPP that the current regional delivery model promotes the use of tenders relative to other MBIs.

It is noted that each jurisdiction has responsibility to review its own legislation in relation to natural resource management and consider the merits of alternative policy tools and institutional arrangements including more collaborative regional / state agency policy approaches. Opportunities to explore collaborative approaches among the different jurisdictions could also be considered, particularly as carbon sequestration and trading may provide a common platform for policy development. Further, NRPPC may wish to consider whether natural resource and environmental management reform overall would benefit from jurisdictions adopting measures to encourage consideration of MBI approaches as part of those processes.

Recommendation 3: The implications of emerging environmental markets

It is recommended that NRPPC note that the development of emerging markets, such as the Carbon Pollution Reduction Scheme and water markets, provides both opportunities and risks to natural resource management because these markets interact. Ongoing NRM investments should seek to capture multiple outcomes and the value of these outcomes in emerging markets. To this end, investment in further MBI capacity building, as outlined in Recommendation 1, should explicitly seek to develop the means to exploit synergies between NRM and emerging environmental markets.

1 THE ROLE OF MBIs AND THE OBJECTIVES OF THE NMBIPP PROGRAM

1.1 Market failure and government policy instruments

Economies such as Australia rely principally on market processes to marshal resources and production processes to supply our needs for goods and services. In the context of land and other resource management, a range of inputs and outputs are extensively traded with market prices transmitting social preferences for more or less of these goods. However environmental outcomes associated with various choices in the management and use of land and other resources often have characteristics that inhibit trade and so their value cannot be captured by landholders in exchange for their provision. Environmental amenities and processes that may as a result be adversely impacted include biodiversity and ecosystem conservation, watershed protection, groundwater recharge and land salinisation, greenhouse gas sequestration and soil conservation.

As the benefits of these 'unpriced' environmental outputs cannot be captured by landholders, there will be under production of them relative to socially desirable levels – and a correspondingly overproduction of priced farm outputs such as crop and livestock produce. The presence of such 'market failures' presents a case for government policy interventions to promote more sustainable natural resource management.

There are four main types of instruments that can be utilised by governments, either alone or in combination, to address market failures - suasive instruments (which use information to influence individual's behaviours), regulatory, market based (supported where necessary by legislation) and public provision of services and infrastructure. The most appropriate policy instrument mix will vary according to the circumstances faced, however market based instruments (MBIs) are likely to be superior when there are a large number of firms who could make beneficial changes and there are large variations in the ability and cost-effectiveness of those firms to do so.

1.2 The emerging use of market based instruments in Australia

'MBIs' encourage behavioural changes through the use of market signals rather than through explicit directives. In this way, government does not require detailed information on who is best placed to make changes and how, rather this information can be 'revealed' by the market.

There has been growing interest in MBIs as they can often deliver equivalent policy outcomes at lower cost by providing firms and landholders flexibility, so that those who face the lowest costs will make the greatest improvements. Conversely, some regulatory approaches can promote inefficiency, inhibit innovation, impose unnecessary costs and potentially foster perverse outcomes. This is particularly so where uniform requirements are placed on businesses but the costs of meeting those requirements along with the benefits from the compliant actions, vary significantly from firm to firm.

MBIs can be categorised as either price based, quantity based or market friction instruments. Price based instruments seek to influence price signals in existing markets - examples include subsidies, grants and tenders. Quantity based instruments establish new rights or the alteration of existing rights, such as through the establishment of tradeable quota on resource access. Market friction instruments aim to improve the operation of existing markets by reducing the costs of operating in those markets, with a notable example being labelling.

Of all MBIs, the focus in natural resource management (NRM) to date has been on positive price instruments such as subsidies and grants. More recently, there has been interest in the use of tenders or auctions to deliver natural resource outcomes rather than fixed grant payments. The objective is to get the best environmental return on the dollars invested by the community by attracting bids from those who can make lower cost land use or management change. Negative price based instruments such as performance bonds, taxes, fees or charges have received less attention.

Similarly, the development of markets for environmental goods or services relating, for example, to salinity, nutrients and greenhouse gases, are still in their infancy in Australia. The few markets created to date focus primarily on urban and industrial activities, although some have sought to extend 'compliance offsets' to rural-based activities. Examples here are in relation to greenhouse gases and water pollutants. Cap and trade mechanisms differ from payments schemes in that the costs of abatement rest with the participants and where possible are shared through trade.

In the early 2000's the primary focus was on the use of competitive tenders following the success of the *BushTender* trials in Victoria. Some state and regional natural resource management agencies began implementing pilots or moving to modest field applications, with a focus on biodiversity conservation. However, knowledge was lacking about why, where and how MBIs operate, their potential advantages and disadvantages, and how to integrate these instruments into policy toolkits.

In response to these knowledge gaps and limited capacity to develop and use MBIs, the National MBI Pilot Program (NMBIPP) was established in 2002 to '*Increase Australia's capacity to use MBIs to deliver natural resources outcomes*' (NRMSC 2002).

1.3 Objectives of the NMBIPP

The National MBI Pilot Program was jointly funded by the Australian and State Governments through the National Action Plan for Salinity and Water Quality (NAPSWQ). A national program was considered appropriate in order to deliver improvements in the national knowledge pool, to facilitate the sharing of knowledge across jurisdictions and as a cost-effective way of filling knowledge gaps.

Funding of \$10 million was invested in two rounds of pilot projects¹ and a capacity building program concurrent with Round 2.

The overall goal of the pilot project component of the program was to (MBIWG 2005):

- design and test new policy mechanisms relevant to a broad range of NRM and environmental issues encountered under the NAP;
- evaluate these options; and
- report to NRM Ministerial Council and the broader community about how these might be employed in the future.

This was to be done by funding projects that would fill gaps in the knowledge needed to design, apply and/or evaluate MBIs. In particular this was to entail greater knowledge about how to (NRMSC 2002):

- apply existing MBIs to new situations (new locations or a new component of the environment);
- deal concurrently with point and diffuse sources of pollution;
- engage the private sector in MBIs;
- define commodities and establish property rights;
- address multiple benefits flowing from a single environmental restoration activity;
- find the optimal scale and market boundaries for MBIs; and
- link actions on the ground (at a property level) with environmental outcomes.

The overall goals of Round 2 were the same as Round 1, however the priorities identified for Round 2 (see Attachment 1) were based on recommendations from two reviews of Round 1 projects (Grafton 2005 and MBIWG 2005). The focus on Round 2 was primarily on the refinement in the design of tender mechanisms as these were seen as the most promising tool for broader implementation.

The objectives of the Capacity Building Program were to (Uhlmann 2008):

- increase NRM stakeholders' knowledge and awareness of how MBIs can be used to complement existing regulatory frameworks to achieve environmental goals or NRM outcomes;
- provide a knowledge platform which enhances stakeholders' skills for greater use of MBIs to address environmental issues more efficiently and more cost effectively; and

¹ Pilot projects were those that were to be tested in the field or in a laboratory setting, for example by using experimental economics techniques.

- promote consistency of application through a 'key principles' approach which acknowledges the science and metrics² while remaining flexible enough to be tailored to apply to specific conditions and regional requirements.

The two stakeholder groups that were targeted by the Program were policy makers within government departments and regional NRM bodies.

1.4 Components of the NMBIPP

The program comprised of an applied research program run over two funding rounds and a capacity building program. Research projects in each round were funded following a general call for tenders. An independent Selection Advisory Panel (SAP) was established with expertise from a range of disciplines (further detail on the selection processes is provided in Section 2.3).

The first call for research proposals in 2002 attracted more than 70 applications. Of these 10 were awarded contracts and funded under Round One of the National MBI Pilot Program. In addition and on the recommendation of the SAP, an additional pilot was sought and funded to evaluate a dryland salinity trading scheme in order to fill a perceived research gap.

Selection criteria (see Attachment 2) required pilots to be based on well-grounded economic principles and good quality biophysical information, and to engage the relevant agents (private sector, institutions, landholders and government) for the major NRM issue addressed. To improve the design, practical application and evaluation of the suitability and performance of MBIs throughout Australia, the selection criteria also emphasised the value of learning and the sharing of knowledge (NMBIWG 2005).

Pilots in Round 1 included investigation of a cap and trade system to manage groundwater recharge that leads to land salinisation, investigation of dryland salinity credits trading, a number of competitive tenders for biodiversity, water quality and vegetation corridors, the use of offsets to manage water quality, trialling conservation insurance and the use of leverage funds to promote land use change.

An independent review of Round 1 (Grafton 2005) was then used to establish priorities for Round 2. Many of the recommendations in the review focused on technical issues associated with tender mechanisms and the projects funded in Round 2 reflected this, with seven of the eight funded projects focusing on tender mechanisms. The other project considered the use of an offsets policy which would operate within current institutional arrangements.

It was identified during the Program that there was a broad lack of awareness and understanding, particularly amongst regional NRM bodies, of when MBIs were a suitable instrument to use and how to select, design and implement an MBI. As a consequence, the

² A metric is a way of measuring an aspect of biological or environmental systems that change under the influence of human activity so as to help define a market transaction. Investment in science and modelling is supporting the development of metrics that can effectively allow a diffuse source of pollution to be treated as a point source.

MBI Capacity Building Program was developed and run concurrent to Round 2. The function of this \$1.2 million program was to produce a base set of information and tools which would then be used as the basis of training and communication activities. The products that were produced by the program included:

Information and tools: A set of eight fact sheets covering the range of MBIs, three Australian case studies and a guideline to support regional NRM bodies in developing a competitive tender³. A decision support tool to guide the appropriate selection of MBIs and a tool containing the essential elements to construct a metric was developed. All information was placed on the Program web site, with the decision support and metrics tools available either as a download or as an on-line learning tool.

Training: A training package and 18 workshops were run throughout Australia to improve the capacity for the design and implementation of MBIs. Two day training workshops were held during 2008 in all jurisdictions. Training included how to select an appropriate MBI, steps involved in instrument design and a number of key technical issues such as the development of metrics. As well as attending the training workshops, individuals could access on-line training tools on the web site.

Networking and training was also provided through a national forum on MBIs. The national forum was held in Brisbane on 30th September and 1 October 2008. The purpose of the National Forum was to share ideas, lessons and experiences on MBIs and to discuss opportunities for their future application⁴. The objective was to attract natural resource managers – both government policy makers and regional NRM bodies, with the secondary target being NGOs, industry and researchers. Networking and information sharing were rated as key outputs from the forum⁵.

Communication: A publicly accessible web site was developed to store all the information products produced. A restricted space on the web site was also established where members can register and connect with other MBI practitioners and a range of experts. An electronic newsletter was developed and distributed on a monthly basis.

Filling knowledge gaps: Seed funding was made available for small projects that aimed to address technical issues associated with MBIs. Following an open call for proposals, funding was provided to 10 projects with a total value of \$180,000. Funding was targeted at regional NRM bodies to enhance their capacity to incorporate MBIs into the array of incentives they are using to generate positive NRM change. The ways in which groups could use the funds was left open, to encourage creative thinking and application.

³ *Competitive Tenders for Conservation Contracts, A practical guide for Catchment Management Authorities and regional NRM groups*, Windle and Rolfe, 2007.

⁴ Information obtained from the *Report on the National MBI Forum*, Sean Marler, Department of Natural Resources and Water.

⁵ Based on feedback from participants. 30 evaluation forms were returned (response rate of 27%).

1.5 The evolving environmental policy context

1.5.1 The regional delivery model for NRM

Under the Australian constitution, State governments have the primary responsibility for natural resource and environmental management. During the 1990s most State governments adopted a catchment based focus to regional NRM and introduced legislation to establish catchment management bodies. Initially these bodies were responsible for a single issue – such as water use and environmental flows, and their role was to establish regionally based plans. A more integrated approach of regional/catchment based NRM planning was variously introduced by the states across a range of issues such as native vegetation management, water and salinity.

Rationalisation of catchment groups was accelerated with the Australian, State and Territory Governments adopting the NAPSWQ in 2000⁶. The NAPSWQ model was based on a regional delivery approach that saw the establishment of 56 regional NRM bodies through which Australian Government NRM funding assistance was delivered. NAPSWQ funds were directed at on-ground projects, generally based on landholders undertaking agreed management actions or delivering outputs, rather than being based on environmental outcomes.

Regional bodies were charged with developing a catchment plan that would identify a set of management priorities. The role of the Australian, State and Territory Governments was based on supporting regional communities to develop and implement their regional catchment natural resource management plans.

A regional approach was seen as offering advantages because the common biophysical characteristics of a region meant that NRM delivery could target landscape-scale outcomes. It was considered that landscape-scale change could most effectively be achieved where communities have a sense of ownership over planning and investment decisions, and are therefore prepared to make the investments in time, resources and better practices to achieve good outcomes and because it provided the flexibility to meet the varying circumstances in the regions.

The regional delivery model empowered regional NRM authorities in targeting investments with priority NRM goals, but provided limited regulatory powers. Accordingly, most of their activities have been based on voluntary land use change supported with NAPSWQ funding.

The funding and focus directed at regional level natural resource management has accompanied other actions by jurisdictions to address a range of national priorities. There has been broad ranging reform of State and territory legislation under the National Water Initiative in order to more clearly define access rights to water resources and facilitate a broadening of the water market. Legislative reform to phase out broad scale land clearing has also occurred in many jurisdictions to achieve biodiversity conservation and other goals.

⁶ Information obtained from www.napswq.gov.au, accessed 13 March 2009.

1.5.2 Increasing focus on 'value-for-money' NRM investments

Reviews of the NAPSWQ found that while communities had been engaged under the program it was questionable whether the funding approach was delivering value for money. For example, the Auditor General (2008, p 19-20) determined that:

"Where the impact [of NAP investment] on resource condition is identified by regional bodies, the expected results were often low (frequently less than one per cent of the longer-term resource condition target)".

The Auditor General (2008, p 17-18) also concluded that there was very little evaluation of the different options available to deliver natural resource outcomes and this also contributed to difficulty in determining value for money.

"The ANAO considers that documentation of the economic costs and benefits of different 'on-ground' actions needs to be substantially improved. There is still little information as to what options are best to deliver value for money outcomes."

A number of commentators, such as Pannell 2008 and Wintle 2009, have argued that the NAP and Natural Heritage Trust (NHT) lacked an outcome-based investment focus and placed priority on regional NRM bodies getting funds spent rather than on cost-effective NRM⁷. They have argued that future government NRM funding should encourage the targeting of effort and outcome-based results.

In March 2008, a new program, Caring for our Country was established to replace both the NAPSWQ and the NHT. While it continues with the regional NRM delivery model its approach is designed to have an emphasis on *"a business approach to investment, clearly articulated outcomes and priorities and improved accountability"*⁸.

These reforms to the way in which natural resource management is tackled in Australia is seeing competitive tender instruments take greater prominence across government and regional NRM bodies as they offer the means to maximise NRM benefits for available investment funds. The increasing interest and application of competitive tender mechanisms has inevitably contributed to, and benefited from, the focus on tender instruments in the NMBIPP.

⁷ These commentators have drawn on a range of government reviews such as by the Australian National Audit Office, both Senate and House of Representatives Committees, and through commissioned consultancies.

⁸ Information obtained from www.nrm.gov.au, accessed 13 March 2009.

2 GOVERNANCE OF THE NMBIPP PROGRAM

The broad governance and administrative arrangements for the Program are reviewed in this section.

2.1 The program model

The NMBIPP was established within the National Action Plan for Salinity and Water Quality (NAPSWQ). This involved a collaborative approach across jurisdictions, with each jurisdiction contributing funding based on the NAPSWQ funding formula. In order to ensure an impartial national approach to the selection of projects, an open tender approach was adopted for funding projects. The open tender had the advantage of transparency, funding pilots in a number of areas across Australia to foster information dissemination and investigating MBIs that could be readily applied. By its nature though, this program model restricts funding to the pool of pilots that were actually proposed.

2.2 Administrative arrangements

The NMBIPP was overseen by a National MBI Working Group made up of Australian, State and Territory Government representatives. Their role was to guide the development of the program and to report to NRPPC and hence Ministers as well as the general community about the outcomes of the program. Members indicated that the Working Group has maintained a collegiate and effective working relationship over the duration of the program, with a primary benefit being the networking and cross-fertilisation of ideas between jurisdictions.

Secretariat and administrative service providers have changed over the duration of the program. Secretariat services have been provided by NSW, Victoria and most recently DAFF, when they were combined with DAFF's administrative role as the host agency. The primary advantage of rotating secretariat responsibility is to provide jurisdictions with greater exposure and connection to the projects, however, the disadvantage has been that knowledge and corporate memory have been lost each time the service provider has changed.

Day to day management of project components of the program was outsourced. Round 1 projects were managed by ABARE and Round 2 projects were managed by GHD (formerly Hassall and Associates). One of the reasons for outsourcing was the economics expertise that was to be provided by these organisations and this was considered a key component of effective management of the projects. A key role of the project managers was to ensure that each of the pilot projects was fundamentally grounded in economic theory.

The capacity building program was managed by a team established within the Queensland Department of Natural Resources and Water on behalf of the Working Group. The team reported to an Oversight Committee, made up of members of the Working Group.

2.3 Selection processes

Selection of the projects in each of the rounds was undertaken by an independent Selection Advisory Panel (SAP). The panel, made up of a multi-disciplinary group of experts, made recommendations directly to NRPPC based on a set of selection criteria. The criteria for Round 1 were provided by Ministerial Council when the Program was established, with the Ministerial Council providing criteria for Round 2 based on the reviews of the previous round.

This process allowed the Working Group to tap into a greater depth of expertise than it had available and to ensure that project methodologies were rigorous and well grounded in economic theory. However, the independence of the SAP and the observance of probity in the selection process meant that project selection was dictated solely by the selection criteria without any moderation for the operational policy needs of government that the WG might have provided.

2.4 Evaluation and review

Each of the components of the program have been independently reviewed and evaluated. The review of the first round of projects was crucial in shaping the priorities of the second round, to which project proponents then responded. The Capacity Building program benefited from a continuous learning approach which improved its effectiveness. For example, a review after the completion of the first few training workshops allowed improvements to be made in the delivery of the remaining workshops.

2.5 Summary

A national coordinated approach was determined as the most appropriate as the primary objective was to improve the national state of knowledge and adoption of MBIs. The program was funded by each jurisdiction contributing according to the NAP funding formula, which meant that each jurisdiction was not guaranteed a direct relationship between the funding provided and the number or funding of projects within their jurisdiction. The adoption of this approach demonstrated that each jurisdiction saw the potential for generalised conclusions and knowledge transfer beyond the individual projects and their regional application. However, in some cases it is possible that individual jurisdiction's priorities have not been able to be addressed within the program.

Governance structures appear to have been sound and accountable, with independent selection and evaluation of the projects. However, there are some lessons learnt from this program that could shape similar programs, namely:

- There can be significant lead times required for decision making in a multi-jurisdictional group that can lead to delays and loss of time available for projects;
- The structure of the program and delays meant that projects were of a short duration (generally less than 18 months for Round 2 projects) which limited the ability to run field-based pilots;

- Outsourcing project selection and management was beneficial but reduced the capacity of the Working Group to ensure operational policy relevance and to engage with the individual projects; and
- Changes in project management contributed to losses in corporate memory and the ability to ensure projects were completed on time and delivered against agreed research objectives.

3 KEY TECHNICAL FINDINGS FROM THE MBI PROGRAM

This section discusses the key technical findings from the pilot projects and the Capacity Building Program and the extent to which program outputs are being drawn on in wider NRM policy development. The key findings from the projects relate primarily to tenders, given their emphasis in the program.

3.1 Key technical findings from the pilot projects

The cost-effectiveness and economic efficiency of tender mechanisms

The attraction to MBIs is that relative to other types of government policies they can be more *cost-effective* (in maximising NRM benefits for available public investment funds) as well as more *economically efficient* (in maximising the efficiency with which resources are used when all public and private costs and benefits are considered).

While projects typically asserted that tenders were more cost effective than traditional grant based approaches in delivering public good outcomes, there was limited evidence to support this claim. Projects that were able to demonstrate increased cost effectiveness included, for example, the Onkaparinga (SA) tender for biodiversity and water quality which estimated a 20-35% budget cost saving compared to existing fixed-grant based approaches; and a pilot project in the West Australian wheat-belt which assessed that a tender mechanism was almost three times as cost effective as the alternative⁹ (NMBIPP 2005).

What the projects have shown is that whether a particular tender application is more cost-effective will depend on its design and the resulting transactions costs. The type of transactions costs associated with MBIs include the costs of ensuring an adequate level of biophysical data is available, communication and awareness raising with potential market participants, the preparation of bids and the enforcement of contracts.

The potential economic efficiency that could be associated with tenders was assessed, for example, by the *EcoTender* project (Victoria). It was concluded that in this case, the tender resulted in a 30% improvement in economic efficiency relative to alternative approaches (Stoneham 2007). The economic efficiency gain is derived from the development of a price for the environmental services sought through the tender and a redistribution of effort to those that could most efficiently deliver the environmental services required. The report concluded that the resource manager could afford to invest up to \$2,500 per site (for example to create environmental metrics, design institutions and contracts and site visits) before all of the economic efficiency gains generated from the tender would be dissipated.

⁹ The alternative policy was based on paying landholders a fixed amount for the management actions (inputs) required for the bids received in the auction.

Information requirements

There is a perception that MBIs require a greater degree of biophysical information and metrics than alternative approaches. While this is often the case, this investment allows better targeting of NRM effort, and hence increased effectiveness and efficiencies. Whether the additional benefits exceed the costs involved is an empiric question that needs to be assessed on a case-by-case basis. There are also potential 'spillover' benefits from the collection of this information which is discussed further below.

Establishment costs

The establishment costs associated with MBIs can be significant. As they are a novel way of approaching an NRM problem, there can be significant investment required in designing and implementing an MBI. Particular aspects can include biophysical profiling, metric design, contract design and communication with participants. As an example, it was assessed that the establishment costs for the Onkaparinga (SA) tender for biodiversity and water quality were about \$100,000 (NMBIPP 2005). As with information, the merits of incurring these costs and using an MBI relative to other policy instruments is context specific.

Notably however, with the independent development of tenders by regional bodies there is no opportunity to spread establishment costs over several institutions running tenders. A key goal of the NMBIPP was to invest strategically in the key elements of tenders (metrics, bid assessment frameworks, contract design and engagement of stakeholders) in order to reduce those costs. The extent to which this has occurred is evaluated in Section 3.4.

Engagement of landholders

The program has demonstrated that engagement of landholders is a key factor driving the success of tender mechanisms and that careful thought needs to be given to engagement strategies. Projects found that participation rates are driven by many factors. While landholders are familiar with markets and many are willing to participate in MBIs, participation rates will be influenced by the type of landholders and their attitudes to a range of issues including risk, the competitive nature of tenders, the length of contracts offered and their understanding of the processes.

While MBIs can be cost-effective and efficient, the program has indicated that there may be cultural issues that need to be overcome in order to realise these gains. There are many misconceptions about how markets work and a concern by some participants that there is not equal opportunity to participate – indeed some participants are concerned that the application of MBIs on occasion does not promote broad participation by a wide range of stakeholders. In order to create constructive relationships (potentially long term) with participants, effort is required by the party(s) responsible to clearly explain to participants how the proposed market works, the rules of the market and how they can play a part.

MBI design is context specific

Many projects assessed aspects of instrument design by comparing alternative approaches. The projects demonstrated that there is no 'right' MBI design but rather that there are tradeoffs with particular design approaches. A number of the key types of tradeoffs are:

- *The scale and scope of tenders*

Larger scale tenders may generate efficiency gains where differences across land uses and environmental services can be accommodated in instrument design and care is taken to maintain landholder participation levels. Misjudging the scale of funding relative to scope can generate substantial inefficiencies

The results of projects demonstrated that efficiency gains may be found in increasing scope across the type of environmental services required and the industries involved, as well as across broad geographic regions¹⁰.

- *Use of input or outcome metrics*

Metrics are designed for the purpose and objectives of the particular policy or program; they are context-specific; and where multiple environmental benefits are involved, decisions may need to be made as to the relative weights given to each environmental outcome sought.

Metrics may focus on changes in management practices and technologies used, on farm outputs or on the delivery of specific environmental outcomes. The incentive force of MBIs will then focus on the practice, output or outcome that is captured in the metric.

The program has confirmed that 'outcome based' incentives offer landholders greater flexibility in how resources are managed and therefore can lower the efficiency cost of achieving NRM gains¹¹. However outcome based incentives will not always be suitable or feasible as they generally take more time and resources to develop, with more complex metrics, rules (such as contract design) and monitoring regimes.

Another advantage of outcome based metrics is that they provide incentives for landholders to reveal through their bids information on the value of private benefits that may be realised in providing environmental services. Therefore the budget cost to government of achieving reforms through for example a tender instrument can be reduced.

However care is needed in shifting compliance risks on to landholders for outcomes that may be outside of their control, such as the impact of extreme weather events such as

¹⁰ See for example, the pilot project '*Optimising the efficiency of conservation tenders under varying degrees of heterogeneity*'.

¹¹ See for example the following projects, '*Designing auctions with outcome bonuses: An application to ground nesting birds in the Murray Catchment NSW*'; '*Auction for Landscape Recovery under Uncertainty*'; and '*Multiple Environmental Instruments: Offsets with Auctions*'.

bushfires. In these situations, outcome-based metrics which inappropriately share performance risks may discourage participation and increase costs to government¹².

- *Contract design and risk sharing*

Related to the choice of metrics is contract design. A number of projects considered how conservation contracts could be designed to efficiently share performance risks and maximise instrument efficiency¹³. Key principles have been documented in a guideline¹⁴ and a number of projects demonstrated the benefits of assigning risk to those parties who have greatest control or management flexibility over each type of risk.

- *Monitoring and enforcement*

An evaluation of enforcement and regulation strategies demonstrated that cost savings could be achieved by targeting monitoring to implementation issues with the greatest potential to undermine instrument efficiency¹⁵. Accordingly, monitoring needs should be considered explicitly within the development of the MBI rather than included passively.

Targeting multiple outcomes

One of the knowledge gaps prior to the program was the extent to which a single MBI tool (such as a tender) could be used to achieve more than one environmental goal. The Program has demonstrated that a tender based MBI may be able to deliver multiple outcomes in a cost-effective way. However, to be effective, multiple outcome tenders require accurate valuation of multiple NRM assets relative to one another at both landscape and site scales. Collecting and assessing this information can be costly and time consuming. The decision on whether to target multiple outcomes therefore needs careful consideration on a case by case basis.

The proposed introduction of the Carbon Pollution Reduction Scheme (a market for greenhouse emissions) by the Australian Government in 2010, provides an opportunity to consider the benefits of a multiple-outcome approach to environmental programs. The NMBIPP has demonstrated the potential benefits that could be achieved through careful targeting of more than one environmental outcome¹⁶.

¹² See for example the pilot project *Improving Water Quality Discharge from the Lockyer Creek*.

¹³ See for example the projects mentioned in footnote 10.

¹⁴ The guideline is *Competitive Tenders for Conservation Contracts, A practical guide for Catchment Management Authorities and regional NRM groups*, Windle and Rolfe, 2007. It can be found on the web site www.marketbasedinstruments.com.au

¹⁵ See for example the pilot project, '*Issues of Enforcement and Regulation in the Application of Market Based Instruments*'.

¹⁶ For example see the pilot project '*EcoTender: Auction for Multiple Environmental Outcomes*'.

Attention to design and testing can improve instrument performance

As MBIs are novel, sometimes complex and require tailoring to the specific circumstances faced, the behavioural changes in NRM being sought are not guaranteed. Therefore attention to instrument design and prior testing will have a significant impact on instrument performance. The program has been able to support the development of an experimental economics approach, which is a new way in which various design elements can be tested before implementation. This approach uses workshops or a laboratory setting in which to enact out how participants would behave under various instrument rules and has proven useful in refining the design of instruments.

For example, a pilot project used experimental economics to assess the most effective way to create tenders to establish conservation corridors within the landscape in the southern desert uplands of Queensland. Using experimental workshops with landholders the researchers were able to conclude that using multiple rounds, rather than the single round format would enable corridors to be established more cost effectively.

Institutional setting

A number of projects have highlighted that regulatory reform would be required to underpin instruments. For example, the pilot project which assessed the potential to achieve salinity benefits concurrent with the government purchase of water entitlements for environmental flows illustrated that this would be infeasible within the existing institutional structure as there would be no means to stop water being traded back into the regions it came from. Alternatively, another pilot project found that a cap and trade instrument was feasible to manage irrigation induced salinity within the Coleambally Irrigation Area as the existing water supply arrangements provided the means to impose the new requirements.

Spillover benefits from investment in MBIs

There is often the concern that MBIs require a greater upfront investment than alternatives policy approaches. However, this upfront investment can have spin-off benefits for other policies. For example, the development of the 'Habitat Hectares' metric in Victoria for the initial investment in *BushTender* then allowed its use for subsequent tenders and as a basis for offsets under the state's native vegetation legislation.

The development of MBIs can also institutionalise the information associated with managing environmental assets and this can be used as an important tool in future management. For example, the Victorian Department of Sustainability and the Environment (DSE) and ABS have been jointly developing environmental accounts as part of the System of National Accounts (SNA) and the System of Integrated Environmental and Economics Accounts (SEEA)¹⁷ based on information generated from MBI pilots in Victoria. The prospect of developing improved data and accounts on the condition of environmental assets is an important spin-off from the

¹⁷ SNA and SEEA are the international standards on national accounts.

application of policy mechanisms, such as MBIs, that are based on transactions. This information can be used to more accurately assess the effectiveness of government intervention and to target future policy actions. This can overcome a key criticism of previous NRM programs in Australia, which has been the lack of data for assessing outcomes achieved (Auditor General 2008).

3.2 Key findings from the Capacity Building Program

The program has engaged the two target groups

The key outcome of the program has been that it has engaged with the two target groups, policy makers and NRM regional groups and has raised awareness. Evidence of this includes the level of engagement with some of the key products produced including:

- Web site visited by 3,800 different visitors;
- Newsletter has a readership of 700;
- Training workshops attended by 303 participants; and
- National forum attracted about 145 delegates, from all states and territories.

The training workshops targeted both NRM bodies (such as CMAs and NGOs) and various levels of government (national, state and local). Both groups were equally represented, with 52% from CMAs/NGOs and 47% from government bodies¹⁸.

Participants in the national forum ranked highly the opportunity to network and obtain knowledge. They rated the diversity and knowledge of presenters highly and indicated they appreciated the honesty of presenters regarding the success or failure of MBIs.

Capacity building is likely to be driven by particular policy needs

The MBI of interest at most workshops was tenders, as these could be more easily implemented within current legislative arrangements. However, participants were also focused on issues specific to their State, such as offsets in Victoria and NSW. In QLD and NSW the feedback was that participants were interested in all the tools, and how to choose the most appropriate one. There was also general interest in the potential for carbon markets, and the range of offsets that may be available. This demonstrates that while general awareness raising about the suite of MBIs tools is useful, the desire to increase capacity is driven by particular policy needs.

¹⁸ Final Report of the Capacity Building Program

Networking opportunities are highly valued

A significant finding of the program is that there is a lack of networking opportunities between MBI practitioners. This may hinder the application of 'best practice' approaches to MBIs. The networking gap is probably most significant amongst NRM regional bodies as government agencies are able to draw on more informal networking opportunities (with the Working Group providing one such opportunity). Nevertheless, feedback from the training workshops and national forum suggests that both policy makers and NRM regional groups benefited from the opportunity to network, share and build upon knowledge and experiences gained.

Regional groups can be constrained in their ability to invest in new approaches

A key finding through the seed funding program has been that there may be few avenues for NRM regional groups to either explore new policy tools (including MBIs) and few opportunities to evaluate project outcomes. Very few NRM regional bodies have the lead times required in order to invest in new approaches such as MBIs. Further, they don't have the necessary skills or resources available to evaluate MBI approaches.

The two target groups have very different capacity needs

The program has also identified that the two target audiences have quite different capacity needs. The primary interest of regional natural resource managers is with tender mechanisms, as these can be implemented within current legislative settings. State natural resource managers have a much broader suite of MBI tools at their disposal, including those that require legislative change. On the other hand, it appears that many regional MBI groups have less understanding about the role MBIs can play, and there are still misconceptions about what constitutes a market based instrument.

Creating collaborative relationships and multi-disciplinary teams is important

Finally, the program has identified the importance of collaborative arrangements and working in multi-disciplinary teams. While raising awareness and developing a base level of capacity is appropriate, external expertise will be needed in many cases to implement an MBI. The program has facilitated the development of collaborative arrangements between NRM bodies and other institutions; however, this has generally occurred on a case by case basis.

3.3 Uptake of program findings

The increasing use of market based instruments in Australia is likely to have been influenced by the NMBIPP findings, both directly and indirectly. Direct uptake of program findings has been facilitated to a large degree by the significant overlap between the key project researchers associated with the program and those developing or assisting MBI policy roll-out at various levels of government and within regional NRM groups. Indirect uptake of program findings is likely to have occurred through a number of methods, including the dissemination of findings from particular projects to other researchers which they have then used in future

projects, the influence that individual working group members have had on policy development in their respective jurisdictions as well as a general awareness raising that has been provided by the workshops, national forum and website.

MBIs have been applied to a wide range of natural resource issues including promoting environmental flows, biodiversity, native vegetation, carbon and urban water quality.

In particular, tender mechanisms have been employed to achieve native vegetation and biodiversity outcomes. The Maintaining Australia's Biodiversity Hotspots Programme has used tenders while the Environmental Stewardship program under Caring for our Country is itself a tender based program to purchase management actions from landholders to deliver environmental outcomes. Australian Government policy officers have confirmed that the selection of a tender mechanism to deliver the objectives of these national programs was strongly influenced by the outputs from of the NMBIPP, and the expertise of Working Group members and consultants involved with the NMBIPP was directly drawn upon to develop the instruments.

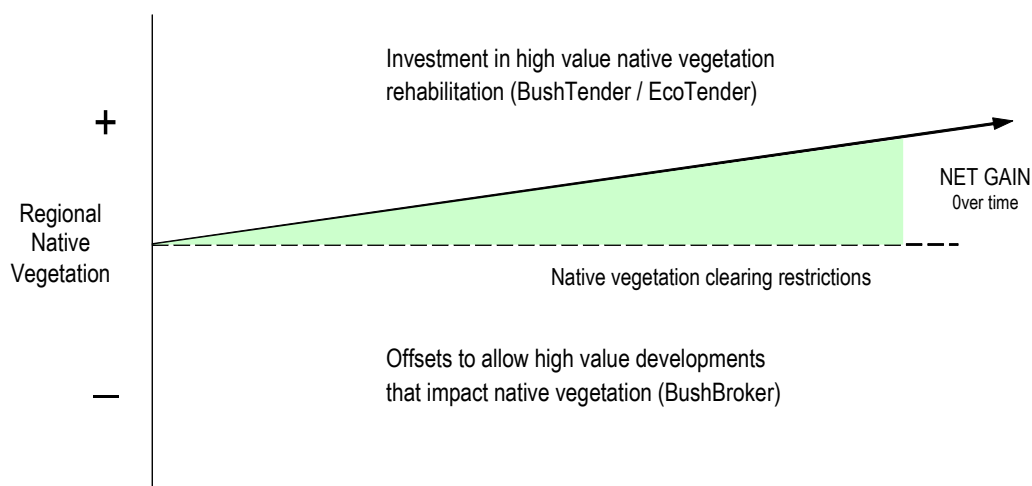
The Queensland government has also purchased environmental services under their Vegetation Incentives Program and more recently under Nature Assist. At the regional level, regional bodies in most jurisdictions are using tender based mechanisms to purchase native vegetation and biodiversity outcomes.

The use of offset instruments is also being used to support native vegetation management in several states. Box 1 explores the way in which projects within the NMBIPP have supported the development of tender and offset instruments which are being employed under Victoria's native vegetation management framework.

Similarly arrangements are being developed in other jurisdictions, such as for example, *BioBanking* offsets which have been introduced in NSW while the Queensland Government has developed an overarching Environmental Offsets Policy which can be applied to a number of natural resource management issues. Arrangements in both States are being implemented to facilitate offset exchange.

Box 1: The use of MBIs to support Victoria's native vegetation management framework

Victoria's native vegetation management framework's goal is to achieve a reversal, across the entire landscape of the long-term decline in the extent and quality of native vegetation, leading to a net gain. Key aspects of the Framework are illustrated in the figure below.



The framework allows for market based instruments – tenders and offsets – to be employed.

State-wide native vegetation retention controls introduced in 1989 require landholders to obtain a planning permit for the removal of native vegetation. If clearing must occur, the clearing must be offset. To assist landholders in meeting their offset requirements in an efficient way, the *BushBroker* scheme provides a system where offsets can be located on a different property.

Opportunities to secure environmental gains are made through strategic public investment in native vegetation rehabilitation. Investments are being made under the *BushTender* and *EcoTender* programs in which landholders competitively tender to improve the quality or extent of their native vegetation. This approach recognises variability in the cost across different landholdings in providing native vegetation improvements, and employs competitive tender processes to ensure the State maximises environmental gains with available investment funds.

The design of the MBIs that support Victoria's native vegetation management framework were directly supported under the NMBIPP - further development of the *BushTender* instrument during Round 1 (Project ID R1-20) and investigation of outcome-based metrics and multilateral offset exchange mechanisms in Round 2 (Project ID R2-20) has underpinned the development of an electronic market for native vegetation offsets. Knowledge arising from these projects is also being drawn on to support similar market based instruments in other states.

In relation to environmental flows, tenders have been used for the purchase of water entitlements under the *Living Murray* and related programs. State governments have also employed tenders, such as with the *Streamflow* (Victoria) and *Riverbank* (NSW) tenders for the purchase of water rights.

3.4 Evaluation of program findings

The focus in the program has been very much on tender based mechanisms because they can be implemented within the existing institutional settings. Because of this focus the objective of a broad investigation of different types of MBIs has not been achieved. In particular, very little attention has been paid to cap and trade systems and offsets.

Notwithstanding the innovative *BushTender* trials, the program has developed design elements to facilitate 'new generation' tenders, such as techniques to target multiple NRM outcomes, the benefits that can be obtained through the design of outcome based contracts and the benefits that can be obtained from effectively targeting the scale and scope of tenders.

Subject to careful design and appropriate application, the evidence suggests that tenders can deliver the theoretical promise to reduce environmental management costs and this makes tenders an attractive tool for programs which place priority on developing cost effective policy interventions.

Nevertheless, the program has not met some of the objectives that it set out to achieve. For example, the program has not empirically tested across a range of settings how efficient and effective MBIs can be relative to other policy instruments.

While specific design of MBIs is context driven, there are some key principles that could be drawn from the pilots, to develop guidelines to support the development of MBIs. While the Capacity Building Program developed a guideline for regional groups on how to conduct a tender, further consideration of creating re-usable design components would reduce barriers in the further uptake of MBIs.

The Capacity Building Program has been successful in raising awareness and in developing base level materials to fill information gaps. It is probably too early to tell whether it has made a long lasting contribution to the appropriate use of MBIs in regional areas. There appears to be only limited interaction with state based policy makers and this suggests limited influence beyond regional NRM groups. It is fair to say in conclusion that capacity to implement MBIs within Australia is still limited.

4 POLICY IMPLICATIONS AND RECOMMENDATIONS

4.1 Key policy findings

The program has demonstrated that MBIs are feasible tools for NRM. MBIs were tested in a number of different locations, with different underlying biophysical and socio-economic conditions and proved to be effective in a range of different situations. It was demonstrated that MBIs can deliver the theoretical promise of cost savings and economic efficiency, and tenders in particular can promote greater returns for public investments in NRM than traditional grants programs¹⁹.

However, it is concluded that it is not possible to make unequivocal conclusions that MBIs will always be more cost-effective than alternative approaches. Whether they are will depend on the policy context, the particular outcomes being sought, the biophysical and socio-economic characteristics of the region as well as the design characteristics that are chosen.

The program reinforced the view that the strength of MBIs is in situations where compliance costs vary. That is, where individuals have differences in the costs of providing environmental services, MBIs can be more economically efficient than approaches such as grants that do not capture this variability in costs as well as providing greater cost-effectiveness in the use of public funds. For these reasons MBIs, and tenders in particular, are well suited to the emerging NRM business model focussed on greater cost-effectiveness and accountability.

In hindsight, a deterministic approach to the NMBIPP was adopted promoting technical research to determine instrument design parameters. However, the program has highlighted that the choice and design of MBIs is context specific – accordingly there is no ‘right’ instrument, metric or design parameters.

The program has identified that MBI design involves trading-off incentive targeting with design, implementation and transaction costs. Therefore MBIs can rarely be ‘off-the-shelf’, but need to be tailored to the circumstances that are faced. This has implications for the provision of on-going expertise to support policy and regional NRM officers in the development of MBIs – particularly the need to build capacity to use identified MBI design principles to analyse and address problems.

Encouragingly, the program has demonstrated that there are some ‘re-usable’ design components that do not need to be re-created for each MBI application, but rather can be refined to prevailing circumstances. The most promising re-usable design components identified are in contract design and the development of metrics. However even the most promising of these developed to date should be regarded as first generation, with scope for further refinement and efficiency gains. Therefore any re-use of available design components should be examined by skilled practitioners to ensure their ‘transferability’ and opportunities for improvement.

¹⁹ A number of examples were presented in section 3.1

The NMBIPP Capacity Building program has promoted the awareness of MBIs, established a practitioner 'community' and made a number of tools and guidelines available. On-going investment will be needed to maintain and strengthen this community. However this in itself will not meet the needs of policy and regional NRM officers in the development of MBIs. Overall, the understanding of MBIs and their potential scope remains low across key State, Territory and Australian Government policy officers who could influence consideration of market based approaches in policy development and review, language barriers remain and the pool of MBI expertise to draw on remains small.

The Program has demonstrated the contribution of experimental economics in refining MBI design and in providing an effective training tool for both market participants and policy officers. However again, the pool of expertise to use this technique is limited with applications dominated by research investigations rather than the support of new policy instruments. Caution is needed in rushing policy problems to the laboratory setting ahead of robust problem contextualisation and the application of economic theory and public policy design considerations. Experimental economics is a microscope with which to refine promising instruments, not a telescope to select instruments from the sphere of available policy tools.

While the NMBIPP has been successful, it has not delivered against all expectations. In particular:

- There was limited attention paid to how MBIs compare to other policy mechanisms available, and what are the appropriate circumstances in which to use an MBI. Projects generally failed to assess the comparative merits of MBIs with other policy instruments with their primary focus being on technical design issues;
- The scope of MBI applications was narrow (focussing almost exclusively on tenders); the breadth of settings less than anticipated; and the number of in-field pilots few. The available timeframes for projects and prevailing institutional arrangements were major contributors to these outcomes. The focus primarily on tenders was, in hindsight, inevitable as:
 - The Round 1 independent review presented tenders as the most attractive research area; and
 - The requirement in Round 2 to collaborate with regional NRM authorities and the preferences of these authorities for tenders as other MBIs impose liabilities on landholders and authorities do not have the regulatory powers to implement other MBIs (this issue is discussed further below).
- There was limited understanding gained as to the potential application of MBIs within the current institutional setting and of the nature and extent of institutional changes that would be needed to support wider use of MBIs.

The current institutional arrangements supporting regionally driven NRM means that similar to the experience of the NMBIPP, tender mechanisms are likely to remain the most feasible MBI.

However the establishment of more strategic partnerships between State governments and regional groups would assist a broader uptake of MBIs. This would also facilitate beneficial interaction between NRM with emerging markets for carbon and water quality. Nevertheless, assuming current institutional settings remain, future MBI capacity building for regional delivery should focus strongly on tenders.

The structure of the NMBIPP also meant that local issues were the primary focus. Projects typically focussed on management issues in a particular catchment with regional groups seeking to test local applicability of tenders. As a consequence, the question of whether tenders could be developed to facilitate landscape-scale change and address cross-catchment priorities was generally not considered²⁰. The scale and scope at which tender mechanisms could operate requires further consideration.

There has been a significant increase in the knowledge associated with the design of metrics delivered through the NMBIPP. And as noted earlier, there is potential for metric frameworks to be re-usable, hence reducing some of the upfront costs associated with MBIs. However notwithstanding the investment made through the NMBIPP and promising results, at this stage metrics have not been delivered to a level to support cross-jurisdictional applications.

Finally, the program has reinforced that there remain misconceptions amongst policy officers about MBIs, and this is likely to be a significant barrier to more widespread uptake. For example, there is a general view that MBIs are about “letting the market work” and therefore they do not require significant government involvement. However while MBIs can undertake the detailed allocation task of who undertakes what changes, this can only occur once government has established the market setting and operational rules – poor design at this early stage will result in poor market outcomes and lost NRM gains.

4.2 Recommendations

The following recommendations provide the opportunity for government to achieve further gains from the NMBIPP and to continue to support the broader policy application of market based instruments in Australia. Recommendations are proposed in three areas:

- the development of a strategy to tackle key remaining capacity building constraints;
- noting the implications of current institutional arrangements for NRM and the uptake of MBIs; and
- the opportunities and risks associated with new emerging markets.

Recommendation 1: Develop a strategy for further capacity building

It is recommended that a strategic proposal be developed to target four capacity building areas: for key government policy officers, for policy economists; for regional natural resource

²⁰ The exception to this was a pilot project in the Burdekin-Fitzroy region of Queensland which used experimental economics to test the validity of using tender mechanisms to develop landscape-scale wildlife corridors

managers; and through investment in key theoretical knowledge. The rationale for further investment in each of these areas is outlined below.

The strategy could be developed by a number of groups, with a number of options canvassed. The key characteristics of such a group are that they would need to have a detailed appreciation of what has been achieved under the NMBIPP, policy expertise in order to ensure that any future investments have a direct link to jurisdictions' operational policy needs and technical economics expertise in order to effectively target the key gaps in economic knowledge.

Potential groups which could bring together the necessary skills and develop a future capacity building strategy include:

- the existing NMBIPP Working Group;
- a new sub-committee under NRPPC; or
- outsource the development of the strategy.

Capacity building for key government policy officers

While the NMBIPP was successful in raising general awareness amongst policy officers about the use of MBIs, it has not provided in-depth training nor has it necessarily reached senior policy decision makers responsible for policy development and review.

It is recommended that a strategy be developed to address this area. The strategy could aim to increase understanding at this level of how MBIs could better feature in policy decision making for natural resource and environmental management.

Capacity building for policy economists

It was noted that in many cases the application of MBIs outside of the program was constrained by the availability of policy economists with the necessary expertise to design an MBI.

It is recommended that a strategy be developed to address this key constraint. In particular, there is a need to consider training in the areas of key principles of MBI design and the use of key techniques such as experimental economics. A key part of this strategy could be a targeted program to further develop re-usable elements of MBI design applicable to different settings.

It is suggested that the strategy consider possible connections to the Australian Research Council funded Economic Design Network or similar network. The purpose of the Economic Design Network is to support the development of economic theory and experimental economics and its application to the design of public policy. The network is active in running workshops, round tables, training courses and an annual summer/winter school.

Capacity building for regional natural resource managers

The NMBIPP also identified that available capacity of regional bodies interested in employing MBIs is also a key constraint to their further uptake. Capacity building can take a number of

forms, including the development of training courses as well as through networking and the establishment of collaborative relationships with economists and other disciplines. It is recommended that a strategy be developed to outline the most effective ways of increasing regional NRM manager's capacity.

In particular it is recommended that the MBI web site that was developed under the NMBIPP be continued with funding provided for its further development and maintenance.

Capacity building through investment in key knowledge development

Pilots funded under the NMBIPP drew on innovative and new techniques in the field of economics. The underlying research in this area is at the frontier of knowledge and there remain further theoretical questions.

It is recommended that a strategic research agenda be developed to consider further theoretical development of MBIs to natural resource management problems. This research agenda could consider issues such as contract design for tender mechanisms, the development of tenders to manage multiple environmental outcomes and further development of metrics. The investment strategy needs to be targeted and focused on what are considered to be the key knowledge gaps that will aid the further uptake of MBIs.

Research bodies such as the Australian Research Council, Research and Development Corporations (particularly Land and Water Australia) and CERF could be approached to consider co-investment in the research.

Recommendation 2: That NRPPC note the implications of current institutional arrangements in limiting MBI application to tender instruments

The Program focussed primarily on tenders due to a number of factors. The most significant of these factors was the institutional setting for regional NRM delivery. Regional groups generally do not have the powers to impose liabilities on fellow landholders (such as charges, offsets, tradeable permits) nor the desire to relative to grant-based approaches.

The extent that regional groups can bring about land use change (in line with their Catchment Action Plans and State Plans) is primarily through facilitating voluntary behavioural change. Within current legislative frameworks there are very few opportunities for regional groups to develop regulatory or revenue raising MBIs. For the most part, they will remain dependent on government funding sources. For this reason, the primary type of instruments that regional bodies are likely to consider will be tenders. These approaches rely on 'contract based' change, with the regional bodies purchasing environmental outcomes from landholders.

It is recommended that NRPPC note the policy finding of the NMBIPP that the current regional delivery model promotes the use of tenders in preference to other MBIs.

Institutional constraints operate at the jurisdictional policy level. Opportunities to adopt and integrate consideration of MBIs into broader policy frameworks may be constrained by existing

legislation frameworks while the interaction of regulatory tools at various levels of government can complicate the design of simple tools especially where different State and local government interests and requirements influence approval processes.

It is noted that each jurisdiction has responsibility to review its own legislation in relation to natural resource management and consider the merits of alternative policy tools and institutional arrangements including more collaborative regional / state agency policy approaches. However NRPPC may wish to consider whether natural resource and environmental management reform overall would benefit from jurisdictions adopting measures to encourage consideration of MBI approaches as part of those processes.

Recommendation 3: The implications of emerging environmental markets

The primary environmental objective of many tenders under the NMBIPP has been biodiversity conservation on private land. However, the NMBIPP demonstrated that effectively targeting multiple environmental objectives could deliver significant cost savings to government. The *EcoTender* project in Victoria (Stoneham 2007) for example demonstrated that a tender that targeted both biodiversity and greenhouse gas emission reduction objectives could reduce the funding requirements by 26% compared to targeting those objectives independently. A corollary to these opportunities to drive down NRM costs is that consideration of environmental goals in isolation from each other could also result in one goal being met to the detriment of others.

It is recommended that NRPPC note that the development of emerging markets, such as the Carbon Pollution Reduction Scheme and water markets, provides both opportunities and risks to natural resource management because these markets interact. Ongoing NRM investments should seek to capture multiple outcomes and the value of these outcomes in emerging markets. To this end, investment in further MBI capacity building, as outlined in Recommendation 1, should explicitly seek to develop the means to exploit synergies between NRM and emerging environmental markets.

REFERENCES

- ASAWA (Action Salinity and Water Quality Australia) 2009, Report for Round 2 of the National Market Based Instruments Pilot Program, Economics Evaluation Report.
- Auditor General (2008). Regional Delivery Model for the Natural Heritage Trust and the National Action Plan for Salinity and Water Quality, Report No. 21 2007–08, Performance Audit, Australian National Audit Office, Canberra.
- GHD Hassall 2009, Round 2 National Market Based Instruments Pilot Program, Final Program Report.
- Grafton, Q. 2005, National Market Based Instruments Pilot Program, Evaluation of Round 1 of the Market Based Instruments Pilot Program.
- MBIWG 2005, National Market Based Instruments Pilot Program, Round 1, An Interim Report by the National Market Based Instruments Working Group.
- NRMSC (Natural Resources Management Standing Committee) 2002, Investigating New Approaches, a Guide to the National Market Based Instruments Pilot Program, A joint initiative of all States, Territories and the Commonwealth under The National Action Plan on Salinity and Water Quality.
- Pannell, D (2008), Environmental policy or environmental outcomes, in Productivity Commission 2009, Promoting Better Environmental Outcomes, Roundtable Proceedings, Productivity Commission, Melbourne
- Stoneham, G. C. 2007, Creating markets for environmental goods and services: A mechanism design approach, Land and Water Australia.
- Uhlmann, V. 2008, MBI Capacity Building Program, Evaluation and Recommendations.
- Windle, J. and Rolfe, J. 2007, Competitive Tenders for Conservation Contracts, A practical guide for Catchment Management Authorities and regional NRM groups.
- Wintle, J 2009, Demonstrating Return on Investment in Caring for our Country, paper presented to the National OUTLOOK Conference, March, Canberra

ACRONYMS

ABARE	Australian Bureau of Agricultural and Resource Economics
ABS	Australian Bureau of Australian Bureau of Statistics
CERF	Commonwealth Environment Research Facilities
CMA	Catchment Management Authority
MBIs	Market Based Instruments
MBIWG	Market Based Instruments Working Group of the Natural Resource Management Ministerial Council
NAPSWQ	National Action Plan for Salinity and Water Quality
NGO	Non-government Organisation
NHT	National Heritage Trust
NMBIPP	National Market Based Instruments Pilot Program
NRM	Natural Resource Management
NRPPC	Natural Resource Policies and Programmes Committee of the Natural Resource Management Standing Committee (which in turn reports to the Natural Resource Management Ministerial Council)

GLOSSARY

Cap-and-trade scheme: A type of quantity-based MBI in which total pollutants or emissions are set a total limit or 'cap'. Permits or quotas are allocated to liable parties and should not exceed the cap limit. Trading of permits is allowed to enable the market to determine how to meet the emission reductions or targets at least cost to the economy. Cap and trade schemes create a market for emissions permits. Cap and trade schemes are also known as emissions trading or emissions allowance trading schemes.

Conservation auction or tender: A price-based instrument used to competitively allocate or fund conservation actions by providing landholders with incentives based on the opportunity cost of undertaking the actions. It involves a competitive process that provides landholders an opportunity to access financial incentives to protect, manage and provide environmental outcomes/services through the establishment of contractual agreement. An organisation (generally government) typically purchases environmental actions/outcomes through bids obtained from landholders. They are also known as auctions or competitive tenders.

Economic efficiency: an economically efficient outcome is one where not more output could be produced by changing the mix of inputs used.

Experimental Economics: is a new way in which various design elements of an MBI can be tested before implementation. This approach uses workshops or a laboratory setting in which to enact out how participants would behave under various instrument rules. It has proven useful as a tool for refining the detail design components associated with instruments.

Grants: A price-based instrument designed to send positive price signals to a group or individual through the provision of fixed-rate subsidies for undertaking a specified action. They are also known as devolved grants because typically an organisation (e.g. government) 'devolves' funds to another smaller organisation (e.g. regional NRM group) to run its own grants scheme.

Market-based instruments (MBIs): Policy tools that encourage behavioural change through the use of market signals rather than through explicit directives or regulations. MBIs need to be supported by appropriate regulatory and institutional frameworks. They are also known as market mechanisms or market incentives for achieving environmental outcomes.

Market failure: Situation where markets are not able to provide the efficient level of production and consumption of goods and services, including natural resources or ecosystem services. There are a number of causes of market failure, including where production or consumption activity has an indirect effect on other activities that is not directly reflected in market prices (an externality). Information asymmetry is one cause of market failure.

Metric: A metric is a way of measuring an aspect of biological or environmental systems that change under the influence of human activity so as to help define a market transaction. Investment in science and modelling is supporting the development of metrics that can effectively allow a diffuse source of pollution to be treated as a point source

Natural resource manager / management (NRM): This refers to regional and State managers of natural resources and environmental assets.

Natural resource management outcomes (NRM outcomes): Improvements in the natural resource or environmental asset, as a consequence of changed management practices. These are also termed environmental outcomes.

Offsets: A positive activity or action taken to counterbalance or compensate for negative environmental impacts from an approved activity or development that cannot otherwise be avoided or minimised. An offset activity may be located within or outside the geographic site of the impact activity and should be supported by a regulatory and legal framework. In the context of NRM, offsets are used to address environmental degradation issues where they are also known as compliance offsets or environmental offsets.

Compliance or environmental offsets are a type of quantity-based MBI that allows a regulated party to undertake an action that creates pollution or reduces ecosystem services if they also undertake (or purchase from another) a separate action that reduces pollution or increases ecosystem services by at least the same amount. They are typically used to meet part of the environmental regulatory requirements imposed on new developments.

Policy intervention: Any act by a government to influence private actions. This may be through regulatory, suasive or market-based approaches, or through the direct provision of goods and services.

Transaction costs: The costs associated with making an economic exchange, such as collecting information or searching, bargaining and enforcement costs.

ATTACHMENT 1: Priorities for Round 2 projects

Priorities for Round 2 were developed from two sources: Evaluation of Round 1 of the Market Based Instrument Pilot Program (Grafton 2005) and The National Market Based Instrument Pilot Program Round One: An Interim Report (National Market Based Instrument Pilot Program Working Group 2005). The priorities were (GHD 2009):

- Pilots that assist the move of MBIs from trial to implementation, such as through capacity building, the development of guidance materials or providing insights into means of overcoming common implementation barriers;
- Pilots that assist in developing trading instruments (such as offsets and cap and trade schemes), particularly between point and diffuse sources and / or through the use of intermediaries such as offset banks;
- Testing the relative merits of price versus quantity based instruments, particularly in the face of uncertainty associated with environmental outcomes;
- Testing whether a mix of MBIs offers a more cost-effective approach to conservation than a single MBI approach;
- A comparison of the merits of input/output/outcome-based metrics;
- Testing the robustness of MBIs in alternative contexts, such as scale, landscapes, industries, agency capacities, institutional settings, etc; and
- The development of MBIs applicable to:
 - multiple goods;
 - interdependent goods;
 - The linking of offset instruments with auctions or cap and trade instruments; and
 - Improving auction contract design to support monitoring and enforcement.

ATTACHMENT 2: Selection criteria for the pilot projects

A2.1 Selection criteria for Round 1 projects:

Selection criteria were categorised as either essential or desirable. The Working Group took the view that any weighting between the categories was at the discretion of the Selection Advisory Panel.

Essential

1. Fills a gap or gaps in the knowledge needed to design, apply and/or evaluate MBIs.
2. Addresses a major NRM (natural resource management) issue such as salinity, declining water quality or loss of biodiversity.
3. Is conceptually robust, in particular well-grounded in economic principles and good quality biophysical information and a sound understanding of biophysical processes.
4. Engages relevant agents, such as the private sector, institutions, landholders and government.
5. Incorporates a sound implementation strategy that identifies and manages risks in implementation (including consideration of any adverse or perverse effects).
6. Incorporates appropriate strategies for evaluation and knowledge transfer.
7. Will be managed by bodies with the experience, skills and knowledge necessary to undertake the pilot.

Desirable

1. Tests measures to overcome impediments to the practical application of MBIs 'on the ground'.
2. Develops cost-effective solutions to the particular NRM problem when compared to or combined with more traditional NRM approaches (such as regulations, zoning, compliance, penalties and charges, and suasive measures).
3. Provides for joint collaboration across a number of jurisdictions.

A2.2 Selection criteria for Round 2 projects:

The selection criteria were (ASAWA 2009):

- Does the project address relevant issues and focus on National Action Plan regions?
- Does the project address priority knowledge gaps, as identified in the Independent Evaluation Report and the Overview Report of the Market Based Instrument Working Group?
- Is the project conceptually robust and well grounded in economic and scientific principles, and supported by appropriate data?

- Does the project engage relevant agents (e.g. Catchment Management Associations)?
- Does the project team have the necessary skills, experience and knowledge?
- Does the project include appropriate strategies for evaluation?
- Will knowledge from the project be relevant to other Australian jurisdictions?

ATTACHMENT 3: Summary of key pilot characteristics

MBI type	Method		NRM focus				Total
	Field pilot	Experimental workshop	Salinity	Water Quality	Biodiversity	Habitat	
Auction	6	5	√	√	√	√	11
Cap and Trade	1	3	√	√			4
Offset	1	1	√				2
Risk Market*	1						1
Leverage	1				√		1
Total	10	9					19

Notes: * The risk market project's focus was primarily on wind erosion.

ATTACHMENT 4: List of Working Group members consulted

Jennifer Stace, NSW Department of Environment and Climate Change

Scott Davenport, NSW Department of Primary Industry

Jason Crean, NSW Department of Primary Industry

Jonathon Green, NT Department of Natural Resources, Environment and the Arts

Ray Baker, QLD Department of Natural Resources and Water

Rachael Hanna, QLD Department of Natural Resources and Water

Darryl Harvey, SA Department of Water, Land and Biodiversity Conservation

John Harkin, Tasmanian Department of Primary Industries and Water

David Feldman, WA Department of Agriculture

Samantha Kortt, Department of the Environment, Water, Heritage and the Arts

Marc Carter, Department of the Environment, Water, Heritage and the Arts

Michael Ross, Department of Agriculture, Fisheries and Forestry

Erica Day, Department of Agriculture, Fisheries and Forestry

Juliana Lazzari, Department of Agriculture, Fisheries and Forestry

Gary Stoneham, Victorian Department of Sustainability and the Environment