
evidence

**Strategic Review of the
Performance-Based Research Fund**

The Assessment Process

June 2008

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1	INTRODUCTION	10
1.1.1	<i>The PBRF</i>	10
1.1.2	<i>PBRF evaluation</i>	10
1.2	REVIEW METHODOLOGY	11
1.2.1	<i>Themes and structure</i>	11
1.2.2	<i>Collecting evidence</i>	11
1.2.3	<i>The balance of evidence</i>	12
1.2.4	<i>Review instrument and survey</i>	12
1.2.5	<i>Limitations</i>	13
1.2.6	<i>Survey participants</i>	14
1.2.7	<i>Timetable</i>	15
1.2.8	<i>Evidence and quotations in this report</i>	16
2	PBRF OBJECTIVES AND ASSESSMENT PROCESS	17
2.1	THE OBJECTIVES OF THE PBRF	17
2.1.1	<i>Objectives in theory</i>	17
2.1.2	<i>Intervention logic</i>	18
2.1.3	<i>Objectives in practice</i>	18
2.2	CHARACTERISTICS OF THE PBRF ASSESSMENT PROCESS	19
2.2.1	<i>The nature of research</i>	19
2.2.2	<i>A definition of research</i>	19
2.2.3	<i>Individual basis for quality assessment</i>	20
2.2.4	<i>Researcher eligibility and categories</i>	20
2.2.5	<i>The Evidence Portfolio (EP)</i>	21
2.2.6	<i>Assessment panels</i>	21
2.2.7	<i>Assessment process</i>	22
2.2.8	<i>Moderation of panel outcomes</i>	22
2.2.9	<i>Quality weightings</i>	23
2.2.10	<i>Subject weightings</i>	23
2.2.11	<i>Reporting</i>	24
2.2.12	<i>Component mix and weighting</i>	24
3	EFFECTS OF THE PBRF ON THE TERTIARY EDUCATION SECTOR	26
3.1	PBRF OBJECTIVES	26
3.1.1	<i>Improving research quality</i>	26
3.1.2	<i>Intervention logic</i>	27
3.1.3	<i>Rewarding research excellence</i>	27
3.1.4	<i>Research and funding in support of postgraduate teaching</i>	28
3.1.5	<i>Improving the quality of public information</i>	28
3.1.6	<i>Summative reputational outcomes</i>	29
3.1.7	<i>Preventing undue concentration</i>	29
3.2	RESEARCH CULTURE AND MANAGEMENT	30
3.2.1	<i>General responses</i>	31
3.2.2	<i>The status of research</i>	32
3.3	CHANGING STRUCTURES	34
3.3.1	<i>Institutional organisation</i>	34
3.3.2	<i>Allocating money and reward</i>	37
3.3.3	<i>Managing people</i>	38
4	THE EQUITY OF THE PBRF	40
4.1	EFFECT ON INSTITUTIONS	41
4.2	EFFECT ON SUBJECTS	44
4.3	RESEARCH GOALS AND MODES	45
4.3.1	<i>A preferred model</i>	45
4.3.2	<i>Risky and innovative research</i>	47
4.3.3	<i>Collaboration and attribution</i>	48

4.3.4	<i>Practice-based and professional development</i>	49
4.3.5	<i>Working with users</i>	50
4.3.6	<i>Regional research</i>	51
4.4	EFFECT ON PEOPLE	52
4.5	MĀORI AND PACIFIC	53
4.5.1	<i>Researchers</i>	53
4.5.2	<i>Subject and discipline</i>	54
4.5.3	<i>Wānanga</i>	56
5	HOW CAN THE PBRF BE IMPROVED?	57
5.1	STABILITY AND CHANGE	57
5.2	PRIOR INFORMATION	58
5.3	WHAT SHOULD BE ASSESSED?	59
5.4	WHO SHOULD BE ASSESSED?	59
5.5	SUBMITTING THE INFORMATION	61
5.6	THE INDIVIDUAL AS THE UNIT OF ASSESSMENT	61
5.6.1	<i>Individual versus group</i>	61
5.6.2	<i>Strong researchers versus sustainable outcomes</i>	62
5.6.3	<i>Individual assessment and staff appraisal</i>	63
5.7	MAPPING TO PANELS	63
5.8	COMPLETING AN EP	64
5.9	SUBJECTS AND REFERRALS	65
5.10	PEER REVIEW PANELS	66
5.11	OTHER VARIABLES	69
5.11.1	<i>External Research Income</i>	69
5.11.2	<i>Research Degree Completions</i>	69
5.12	HANDLING METRICS FROM INDIVIDUAL EPS	70
5.12.1	<i>The release of individual scores</i>	70
5.12.2	<i>Performance appraisal</i>	71
5.13	WEIGHTING FACTORS	72
5.13.1	<i>Weighting factors within the EP and associated components</i>	72
5.13.2	<i>Weighting factors – staff grades</i>	73
5.13.3	<i>Weighting factors – subjects</i>	74
5.14	REPORTING	74
6	CLOSING REMARKS	75
6.1.1	<i>Positive outcomes</i>	75
6.1.2	<i>Negative effects</i>	75
6.1.3	<i>A problem of policy</i>	76
6.1.4	<i>What universities do</i>	76
6.1.5	<i>Implications</i>	77
6.1.6	<i>Funding levels</i>	78
ANNEX 1.	TERMS OF REFERENCE	79
ANNEX 2.	MEMBERS OF THE REVIEW ADVISORY GROUP	81
ANNEX 3.	PEER REVIEW PANELS	82
ANNEX 4.	TERTIARY EDUCATION ORGANISATIONS IN THIS REVIEW	84
ANNEX 5.	INTERVIEWEES	86
ANNEX 6.	THE REVIEW INSTRUMENT	90
ANNEX 7.	BIBLIOGRAPHY	94
ANNEX 8.	GLOSSARY	107

Executive summary

An independent strategic review of New Zealand's Performance-Based Research Fund (the PBRF) was carried out during February-April 2008 by Dr Jonathan Adams (*Evidence Ltd*, UK), an independent, non-native expert. It had three areas of focus: near-term benefits to the country; differentiated effects on participants; and potential improvements. It will inform decision-making within the Tertiary Education Commission (the TEC) and aid the work of the 2012 PBRF Sector Reference Group (SRG).

The review comprised an extensive programme of individual interviews, focus groups, and group interviews with about 200 informants across a wide range of disciplines and institutions, collection of written submissions from interested parties and the analysis of secondary data sources by the reviewer and staff of the TEC and the Ministry of Education (MoE).

The review relies heavily on a qualitative evidence base, because the PBRF has only had two cycles in 2003 and 2006 and it is too early to expect quantitative evidence of change. The analysis identifies funding and reputational outcomes which are important drivers for the formative outcome that has led to changes in behaviour for individuals and their organisations.

That analysis confirms that the PBRF has been effective in delivering beneficial outcomes in financial, reputational and formative terms.

- Research resources are directed more selectively to institutions judged by the PBRF process to have delivered better research. Resources are allocated in line with Quality Evaluation (QE), External Research Income (ERI) and Research Degree Completions (RDCs). The PBRF has shifted research funding towards universities and away from institutes of technology and polytechnics (ITPs), wānanga and private training establishments (PTEs), and shifted the balance among universities.
- There is now more and better information about relative research quality at institutional and subject level. There is widespread agreement across the sector that the summative outcomes are a fair judgment of relative standing, though some disagreement exists about individual scores.
- The PBRF has sharpened consciousness of the place of 'excellence' across academic activity.
- There have been significant changes in the management of research, in research culture and awareness and in the priority given to research activity. Interviews provide convincing evidence that the PBRF is having a pervasive effect on the status placed on the research mission by staff and managers. The PBRF is associated with substantial refocusing of institutional research strategy and the development of better support mechanisms.
- The cultural shift has empowered tertiary education organisation (TEO) management to act where it had met cultural conservatism and resistance. While many changes have been positive, staff development has been patchy and there is misuse of PBRF outcomes as a staff-appraisal substitute. It is now essential that management understands the need to provide feedback as tangible improvements in the research environment of those staff who are contributing most to institutional successes, but they need resources from the TEC to do this.
- There is appreciable concern amongst academics and observers about whether the pace of change can be sustained without additional resources to maintain the momentum of an expanding research base.

Subject to the funding caveat, it is reasonable to expect that these outcomes will lead to an overall improvement in the performance of the New Zealand research base and in the

country's relative international standing. The outcomes also correspond in detail to the prior intervention logic used by the TEC.

New Zealand benefits from differentiation among its TEOs. The PBRF is loaded with prestige issues because of the link between research activity and degree-level teaching and there is a sense that the 'playing field' is tilted to favour universities. This might be remedied by broadening the membership of the peer review panels.

- The ITPs expect to invest in knowledge development in appropriate support of their mission. Some institutions are meeting the research requirement for teaching degrees but are unable to access funding to perform that research because the modes and fields in which ITPs operate are not sufficiently recognised by the PBRF.
- For PTEs, the TEC might use the Investment Plans as a forum in which to explore, evaluate and support the 'applied research' component of their activity. This would reduce costs and enhance benefits for the TEOs.

Are there undesirable consequences of the PBRF?

- There is a risk that the PBRF model over-promotes a particular research outcome, one that most easily fits a traditional western scientific paradigm. This may have an effect on research links with users, policy-based research and non-university research portfolios.
- The PBRF model tends to privilege research fields and modes that most readily interact with its assessment model. For example, it works less well for longer-term research, social sciences and the creative arts. Laboratory-based experimentation can lead rapidly from hypothesis to outcome but field or survey-based work has a longer cycle-time.
- No fields can be labelled as wholly risky or not, so the question is about behaviour not disciplines. Those who are confident in their work will continue to pursue exciting goals while, as also noted in the USA, the less confident will become more conservative.
- There are continuing issues around the effect of the PBRF's individual assessment on new and emerging researchers (NEs).

Are there impacts on provider engagement with the community, or on the contribution of academics to administration within their institution?

- The PBRF is an equitable policy mechanism considered in terms of the specific purpose of promoting research excellence. It would damage its effectiveness if the PBRF were required to have multiple functions of equal priority, such as utility, commercial value or cultural development. It is, for example, undesirable that the PBRF becomes confused with policy on innovation *per se*.
- There is some concern that the PBRF affects professional practice, user-related research and commercialisation. This stems from differing views on what constitutes research excellence despite the breadth of the guidelines. Senior staff may have footholds in academia and a profession, but high-impact, non-academic activity across a blurred boundary does not readily qualify as 'original research'. Subjects associated with applied research and professional practice are less likely to produce readily assessable outputs.
- Journal articles are submitted relatively frequently as Nominated Research Outputs (NROs) whereas Reports for external bodies represent less than one-tenth of the available source material. Panels need to affirm the value of such outputs and the research they communicate.

- Commercialisation should be an end in itself: if research is worth exploiting then the outcome provides both kudos and reward. Good applied research is usually derived from good basic research and there is synergy in feedback with the user.
- There has been a desirable rebalancing from a system that over-emphasised teaching effort while marginalising research. There is no evidence that administration has been compromised. Instead, staff recognise its place within their contribution to the research environment.
- Initially, PBRF costs were seen as high. It is now recognised that there were inevitable implementation costs and some costs attributed to assessment are in fact part of enhancing research management.

What are the impacts on Māori and Pacific Peoples researchers?

- Māori researchers are equitably assessed but disproportionately 'new' to research and have lower average outcomes. Data on Pacific researchers are too sparse for sound conclusions.
- There are distinctive, differential characteristics linked to 'western academic' and Māori approaches but this conflict is not unique. A consensus about international reference points may emerge from trans-national indigenous research communities. Māori knowledge and development should not be funded through another mechanism as this risks stigmatising such research.
- The wānanga have the potential to make an essential contribution to knowledge and to enable New Zealand to make the most effective use of all its talent. It is a challenge to the PBRF model, however, to evaluate what the wānanga are doing and an interim alternative funding stream may be appropriate.

Can the current PBRF system be improved?

- The community is content with the broad structure of the assessment and would prefer consolidation in the short-term. Opportunity for more substantial modification after 2012 can be anticipated by planning and consultation now.
- Peer-review panels carried out an effective and onerous task but were not always thought to have responded to their disciplinary cultures by tuning the generic assessment guidelines appropriately. They should be given more training, more time to meet and empowered to give a reflective assessment beyond the core PBRF paradigm.
- Three staff-related changes are discussed. One would be to restrict the eligible population to a more closely-defined group of core, permanent academic staff who represent principal investigators (PIs). Second, there is an argument that a shift to the group as the unit of assessment would enable better evaluation of the research environment and avoid emerging issues around staff age profiles. Third, staff should be explicitly mapped to panels prior to assessment so as to reduce 'games-playing' and improve information outcomes.
- If the individual remains the unit of assessment then the scores should be disassociated from staff names. The feedback to staff that the scores represent is not necessarily informative without interpretation, and may impact on morale. More seriously, there is evidence that institutions are abusing this information and using it for staff appraisal in place of proper staff-development programmes.
- There were no strong views about the weightings of the three evidence portfolio (EP) components.
- The weighting bands for staff grades (A, B, C) might be modified to increase the gain between A and B staff so that there is a clear financial and scoring benefit to raising staff to the highest level of excellence.

- The weighting for RDCs (25%) may be unduly large given that they represent quantity rather than quality. This might be reduced to the same level (15%) as the ERI thereby raising the EP from 60% to 70% of the QE.
- The subject-area cost-weightings are derived from teaching-related data which may not be an appropriate baseline for research activity. They should be reviewed with a view to clarifying their purpose, as incentives or cost-compensation.

Will the PBRF achieve its objectives?

- The PBRF is already delivering important and appropriate outcomes of significant economic, social and cultural benefit. It can sustain the process of change and fully achieve its objectives with modest modification if it is funded at a level that responds to the growth of opportunity and activity that it has stimulated.
- If the PBRF is to achieve its goals then the broader role of research in the New Zealand economy should be re-examined. The research debate in New Zealand is focused on utilitarian short-termism and functionality. The small research community has an incredibly high level of achievement but the economic context is not supportive. Gross Expenditure on Research and Development (GERD) is about 1.2% compared to an EU-15 average of about 1.8%. An exceptionally low proportion of that GERD is in Business Expenditure in Research and Development (BERD). GDP per capita has fallen because New Zealand relies on commodity exports with a dependence on public-sector research and development (R&D).
- Diversification and new opportunities will come from innovation in a knowledge-based economy. TEOs uniquely produce people, highly-skilled people trained in finding and using knowledge to solve problems across the economy. Allocating funds against assessable research excellence in TEOs delivers important social and economic outcomes because TEOs can more effectively educate skilled, curious, entrepreneurial New Zealanders if their staff are engaged in high-quality research.
- The 2008 budget announcements on the PBRF suggest it will grow in line with inflation which may not be sufficient to drive the outcomes that policy expects. Better research costs more money, and that emergent demand will inevitably rise faster than inflation in the economy generally.
- The outcomes of the PBRF are positive and its marginal negative effects can be remedied. The negative effects of failing to add the necessary fuel to empower this stronger research engine for New Zealand are likely to be more serious and offset the clear gains in research culture, activity and outcome that have been made in such a very short time.

1 Introduction

This document reports an independent strategic review of New Zealand's Performance-Based Research Fund (the PBRF) carried out during February-April 2008. It is directed by Ministerial instructions for the evaluation strategy and has three areas of focus: near-term effects; differentiated effects; and potential improvements. It is a source to inform decision-making within the Tertiary Education Commission (the TEC) and to aid the work of the 2012 PBRF Sector Reference Group (SRG).

Note that the review is about the assessment process used to acquire the metrics required to distribute funds, not about the PBRF itself, the value and continued existence of which was taken as a given. Within the New Zealand research base, the fund and the process used to distribute the fund are frequently not differentiated. When people speak of "the PBRF" they refer as much to the work required to assemble evidence for assessment as they do to the resources subsequently disbursed.

In this report I shall follow local practice and refer generically to "the PBRF" when discussing assessment.

1.1.1 The PBRF

The PBRF was one of the key recommendations set out in the Fourth Report of the Tertiary Education Advisory Commission (TEAC, 2001). Those arguments were elaborated by the report on 'Investing in Excellence' (MoE, 2002) and by the SRG (TEC, 2005), which are essential background documents for those studying the development of the PBRF process. Because the process has been comprehensively described elsewhere, I will only provide essential details.

The primary aim of the PBRF is to encourage and reward research excellence in the tertiary education sector within New Zealand. The research performance of Tertiary Education Organisations (TEOs, including universities, polytechnics, institutes of technology, wānanga, Bible colleges and other private training establishments (PTEs)) is assessed on the basis of performance appraisal implemented via the peer review of an Evidence Portfolio (EP) submitted by researchers. Funding is geared against both this assessment and against External Research Income (ERI) and Research Degree Completions (RDCs).

The PBRF is managed, implemented and evaluated by the TEC on behalf of the New Zealand government. A first full assessment of the quality of TEO research via this system took place in 2003, a further partial round was implemented in 2006, and the PBRF Quality Evaluation will run again in 2012.

In 2003, 22 TEOs submitted 8,018 EPs while in 2006 33 TEOs submitted 8,671 EPs. Because 2006 was a partial round, many eligible staff who submitted in 2003 chose to retain their score and not to be reassessed, so only 4,532 individuals had their EPs reviewed.

1.1.2 PBRF evaluation

To meet the requirements of ministerial and cabinet instructions, the TEC and the Ministry of Education (MoE) developed an evaluation strategy for the PBRF (MoE, 2002). The evaluation strategy has three phases. The first phase was to cover the implementation of the new fund (WebResearch, 2004). The second (this review) is intended to give a sense of emerging effects and any unintended consequences. The third will be a longer-term assessment of outcomes.

The various phases of the evaluation strategy reflect concerns that arose during the original policy design. First, the system is complex, implementation needs to be seen to be aligned with policy goals and compliance costs should be minimised. Second, issues identified

during the policy development need to be re-examined. Third, longer-term evaluation should assess whether the policy has succeeded in lifting research quality.

1.2 Review methodology

The review has been carried out by an independent, non-native expert. The review period in New Zealand was necessarily limited. The review focused on gathering qualitative evidence, backed up by quantitative analyses provided by the TEC.

1.2.1 Themes and structure

The terms of reference for this second phase review were set by government (Annex 1).

The review was supported by a Review Advisory Group (members listed at Annex 2), which met on several occasions in late 2007 and through 2008 in order to discuss the proposals, work programme and draft report developed by the reviewer.

The themes around which this report gathers substance are foreshadowed in the terms of reference and were elaborated in response to the principal issues raised by interviewees.

- What has been the effect of the PBRF on the New Zealand research base in TEOs? To what extent has it achieved its objectives?
- What have been the differential effects of the PBRF on modes of research, disciplines, institutions and researchers? Is it an equitable process?
- How might the PBRF be modified to increase the likelihood of further benefit and to address any undesirable inequities?

To put this another way: is the PBRF working for the country, is it working for all the participants, how well does it function and could it work better?

1.2.2 Collecting evidence

The review comprised individual interviews, focus groups, and group interviews with informants, collection of written submissions from interested parties and the analysis of secondary data sources by the reviewer and staff of the TEC and the MoE. This approach was intended to minimise the participation costs associated with other approaches to data collection whilst at the same time addressing the sector requirement for impartiality.

There were several, complementary routes to collecting evidence.

- Initial collection and review of literature and background documentation.
- Meetings with key stakeholders, including individuals and organisations.
- A survey via focus group and individual meetings (Section 1.2.7: Timetable) to collect informant views and responses against a semi-structured pro forma (the review instrument: Annex 6).
- Open invitation to stakeholders to submit written views and responses.
- Four evaluation working papers specifically prepared by the TEC (available on the TEC website) and additional data analyses prepared by the MoE.

There is an extensive literature which forms the reading background to any investigation of the PBRF. A detailed bibliography is attached (Annex 7) but only a small selection of this material is specifically cited in the text. This is because the focus of the review is on current effects and areas for improvement in the New Zealand system whereas the literature is inevitably scene-setting and historical. The evidence gathered for the review is more recent than the published material.

The reviewer, while independent, relied on the TEC for the provision and analysis of relevant data. The secondary analyses of PBRF data carried out by the TEC had been determined prior to the review and drafts were made available to the reviewer during its latter stages. These reports are available at <http://www.tec.govt.nz/templates/standard.aspx?id=2547>.

1.2.3 The balance of evidence

I have placed considerable weight in the later analysis and discussion on the subjective, qualitative material gathered in interviews. This is because many of the anticipated systematic effects of the PBRF are at too early a stage to be indexed. The quantitative information is a complement to the qualitative aspects, but while the data on specifics, such as changes in numbers, are interesting they reveal rather little at this time about what is happening.

We need the 'why' of people's experience and opinions to bring meaning to the 'what' captured in the numbers.

Increases in output and shifts in funding can only be understood if we know what motivates the researchers and whether the resources are sufficient to enable change. Changes in staff numbers, across grades and disciplines, may reveal "games-playing" in TEO presentation or an overdue revision of staffing profiles. We need to ask about what has happened on the ground.

The PBRF is a mechanism to change attitudes right the way through the system. Its outcomes will depend on what the researchers believe to be true, not upon what policy experts and officials assert is true. I therefore make no apology for focussing on what the people who are involved and expert in research have told me.

1.2.4 Review instrument and survey

Information was gathered by the reviewer via a semi-structured interview process.

Key issues for the review were identified by Ministerial directive, analysis of background documentation and from the associated literature. This led to an outline of topics against which the research community's views would be sought. This outline was modified into a template for interviews (the review instrument: Annex 6) structured around the terms of reference set by government for the review process.

A semi-structured interview template was used to create an informed structure and to enable a reasonable degree of comparability across institutions and subjects without being unduly prescriptive. Many interviews ranged more widely than the basic template, according to the background and knowledge of the interviewees or because specific issues had greater weight in some locations.

The review instrument served a number of ancillary purposes. It was created as part of preparatory development prior to starting work in New Zealand. It provided a background reference structure for the review and was therefore shared with the Review Advisory Group at its meeting in December 2007. It was further refined in the light of discussion with and advice from TEC staff.

The instrument also served as a notice to TEOs and stakeholders of the reviewer's priorities. It was circulated to TEOs ahead of the one-on-one interviews and focus group meetings in week two of the main work programme. It was used as a basis for discussion at these meetings, and was then modified using feedback and in the light of the issues raised by informants.

In practice, rather little change was made to the review instrument between the pilot phase and the subsequent survey. This was probably because the preliminary work and advice had focused the interview template on a consensus agenda shared across the TEOs. This

proved to accord closely to the priorities of the interviewees and they were readily able to offer evidence and opinion around these themes. Some assumptions on the part of the reviewer were modified in the pilot work, however, particularly regarding differences between UK and New Zealand methodology and the cultural attitudes of the tertiary education communities.

In week three, an initial set of draft 'position papers' was created from the literature review, the informant meetings and – particularly – from the analyses of discussions with the focus groups. The contents of these position papers were discussed with policy staff at the TEC and with key individuals in the tertiary sector.

The final version of the review instrument was circulated to TEOs for the individual staff meetings in weeks four and five. These meetings were used not only to gather further evidence against the template of the review instrument but also to test and challenge the interim concepts developed in the draft position papers, seeking to determine the extent to which general issues were maintained across institutions and across disciplines.

The review instrument also formed the template for the invitation to submit written responses.

1.2.5 Limitations

Feedback received through the Review Advisory Group suggests that most stakeholders' and institutions appeared satisfied that the conduct and methods were fair and reasonable.

The biggest limitation in this review is also a key strength: it was carried out by an independent, international expert.

The strength of such a review is that the work is informed by experience elsewhere. While each country's tertiary education system has its own peculiarities, there is also a self-similarity driven by common purpose (teaching, research and administration) and the long reach of the academic communities which tend to work in rather than for their employing institutions.

The greatest weakness emerges from a further strength in that the reviewer has little reason not to report their findings objectively, because they are not part of the system. But, by being a 'visitor', they may remain ignorant of or misjudge issues deemed important to some parties, misunderstand vital nuances and fail properly to interpret what is put in front of them.

Further limitations deriving from distance are that much background information acquired prior to the review required significant reinterpretation, or decoding, once the work in New Zealand had started. The fieldwork was inevitably compressed, leaving little time to digest and reflect on outcomes. And the post-review development of this report had to be implemented without the iterative feedback that might be more common when working in a 'home' environment. This leaves possible errors and omissions in the final document, which careful work by the TEC and the Review Advisory Group has sought to minimise.

An implied 'limitation' raised later was that the survey, in the pilot and in the later work, tended to acquire more information about research leaders and the more research-active than about the rest of the community. This was entirely deliberate. There is very little point in focussing a survey of methodology designed to assess and fund research excellence on those who are explicitly not doing excellent research. There is certainly an argument that some investment might be directed to improve capacity and remedy poor performance, but that it is not the aim of the PBRF. Within the time available, the reviewer deemed it more essential to acquire information about whether the PBRF does support excellence.

A worrying limitation concerns evidence on participation and performance by Māori and Pacific peoples' researchers. There is very little information, and few participants, among Pacific peoples and any comment would therefore be incautious. On Māori researchers, The TEC has produced a report and visits were made to two wānanga but rather few

researchers were among the interviewees. Conclusions are therefore approached with caution.

Finally, only a small number of 'new and emerging researchers' (NEs) were included in interviews although some later wrote in to the reviewer. Given that about 20% of assessed staff were in relevant categories (defined later) this could be seen as an imbalance. At the same time, such staff inevitably had somewhat less overview and experience and their perception of change consequential upon the PBRF was clearly limited. To address the deficit, not fully appreciated until the end of the field-work, a number of additional responses were solicited from researchers in this category. These are neither random nor stratified but they provide a stimulating source of rather different views.

The greatest limitation might be that the interpretation of one reviewer is tasked with the inputs from many institutions and a myriad of disciplines and experiences. The key test for the reviewer was one of consistency in the outcomes and sense in the conclusions.

1.2.6 Survey participants

Choices about survey participants were made by TEC staff after initial consultation with the reviewer. The key stakeholders were all identified by the TEC, based on the TEC's perception of priorities and relevance. All communications with the reviewer were through support staff working for the TEC.

Focus groups were used in the initial part of the TEO survey to pilot the review instrument. This was requested by the reviewer in order to acquire a diversity of views: a submersion in the New Zealand discourse. The TEOs were asked to ensure that focus groups included a spectrum of staff from selected subject areas, but senior and managerial staff (heads of department and administrative services) were generally excluded. The intention was to allow both consensus and contention to emerge in open and frank discussion and to provide an opportunity for the views of more and less active researchers to be acquired. Recordings of these focus groups were taken for reference and subsequently erased.

The disciplines for the focus groups were chosen by the reviewer and deliberately took core areas in clinical medicine, the physical sciences, the social sciences and in creative arts. This choice was intended to provide a cross-campus spread, some comparators between institutions and some explicit anchor points to non-New Zealand experience (for example, physics and education have both been the subject of the reviewer's recent work in the United Kingdom).

In addition to stakeholders identified by the TEC, the reviewer also interviewed research managers and administrators during the pilot phase. This provided a non-disciplinary overview from the perspective of individual institutions. The research managers are a particularly well-informed group, who maintain their own network across institutions and can therefore also cast light from a system perspective. They encounter the functional problems that management of the PBRF process throws up at institutional level and are aware of many issues that academics only see in a clarified form.

Several members of TEO senior management teams were able to provide an early input to the review, for which the reviewer is extremely grateful. These individuals had the widest oversight of the PBRF implementation, being involved in forums outside their own institution as well as seeing the detailed effects locally.

For the more extensive, second phase of TEO survey work, the reviewer developed a matrix of institutions, disciplines and PBRF outcomes. TEOs were advised of subjects to be covered at their location but were left free to choose exactly which disciplines and representatives might be interviewed. The aim was to ensure that a broadly holistic sample was taken within reasonable work bounds, with appropriate overlap but without undue duplication. Most of the meetings were with single respondents, some were with several

staff across a discipline group and some were with a panel from a selected suite of key disciplines.

A key part of this second phase was to test the outcomes of the pilot work and the interim 'position papers'. Therefore, the emphasis of interviews was to test the validity of the interim conclusions and the consistency of their relevance in different environments. Unlike many other surveys, however, the review continued to produce new information and variant insights right through to the final subject interview and the final institutional visit.

Group meetings were also held in Auckland and Wellington with some ITPs and smaller TEOs. These proved valuable in drawing attention to the diversity of outcomes and expectations for institutions with diverse research histories. Although these meetings were collective, that aspect helped to affirm a core commonality of view as well as exposing subtle differences.

A list of survey participants is attached in Annex 5.

1.2.7 Timetable

Table 1. The timetable for the 2008 independent review of the PBRF

Development

November 2007	Review of TEC formal documents Analysis of background material
December 2007	Initial planning of institutional site visits
10 December 2007	Meeting of Review Advisory Group
January – February 2008	Detailed planning of site visits. Development of outline semi-structured interview pro forma (the review instrument)

Main programme

Week 1	Start of field programme in New Zealand
February 11 – 15	Meetings with TEC and MoE staff
13 February 2008	Meetings with key stakeholders Meeting of Review Advisory Group
Week 2	Meetings with further key stakeholders and representative bodies to enhance understanding of the New Zealand context from a policy, sector, and cultural perspective
February 18 – 22	Meetings with research managers Subject-based focus groups in institutions in North and South Island

Week 3 February 25 – 29	Review of outcomes from one-on-one interviews, focus groups, and group interviews; development of review instrument Meetings with trades unions Meetings with key staff from ITPs
Week 4 March 3 – 7	Detailed institutional visits with individual staff, North Island Meetings with key staff from PTEs Meeting with senior CRI staff
Week 5 March 10 – 14	Detailed institutional visits with individual staff, North and South Island
Week 6 April 7 – 11	Meeting with Te Kahui Amokura Meetings with wānanga
Reporting	
Week 6 (cont.)	Reporting meetings with TEC executive, management and staff
April – May 2008	Development of written report (draft)
27 May 2008	Meeting of Review Advisory Group
June 2008	Finalisation of written report

1.2.8 Evidence and quotations in this report

The material presented in this report focuses particularly on discussions between TEO staff and the reviewer. The background discussion also draws on the written responses, the reports produced by the TEC (<http://www.tec.govt.nz/templates/standard.aspx?id=2547>) and the MoE and the wider literature.

The quotes used to reflect the views expressed by informants represent a small part of what people contributed, but they are intended to be a fair reflection and balance, and sometimes one quotation has to stand for a point that many people made in slightly different ways. This approach has been extensively used by the reviewer in work for agencies in the UK and Europe and, if applied judiciously, has been found by previous clients to provide a fair, balanced and informative outcome.

Interviewees were assured of confidentiality, but the text would be anodyne if some indication of source was not given. I sought to refer to both role and discipline for each quote, and the type of TEO where this seemed relevant. Unfortunately, quotes linked to subject were still deemed identifiable by the Review Advisory Group. Anonymisation has therefore been reset at a rather bland 'faculty' level.

Some quotes are attributed to focus groups. These include the early focus groups in selected subjects and some later meetings in other subject areas where the discussion included three or more members of a department who wished to contribute.

2 PBRF objectives and assessment process

In this section I review the objectives and characteristics of the PBRF policy and its implementation and point to some of the issues that emerge. This is not intended to be a comprehensive description. That has been done elsewhere (eg. MoE, 2002; TEC, 2007) and on the TEC website (<http://www.tec.govt.nz/templates/standard.aspx?id=2547>).

2.1 The objectives of the PBRF

2.1.1 Objectives in theory

The PBRF has, like many public policy instruments, evolved or adopted a number of related objectives. The guidelines for the 2006 PBRF cycle give its aims as follows (TEC, 2005: page 12).

“The main aims of the PBRF, as agreed by government, are to:

- Increase the average quality of research.
- Ensure that research continues to support degree and postgraduate teaching.
- Ensure that funding is available for postgraduate students and new researchers.
- Improve the quality of public information on research output.
- Prevent undue concentration of funding that would undermine research support for all degrees or prevent access to the system by new researchers.
- Underpin the existing research strength in the tertiary education sector.”

The most frequently-stated primary aim for the PBRF, as a fund, is to reward research excellence in the New Zealand tertiary education sector (essentially the last aim above). It is expected that this will lead to the general improvement of research performance in that part of the country’s research base (the first aim above).

It is worth noting an interesting criticism of the PBRF’s objectives.

“The problem that the PBRF was intended to solve has never been properly defined. Where is the evidence that the TEOs were underperforming, given the level of funding they faced?” *Association of University Staff*

In other words: what is the null hypothesis? What trajectory would the research base have followed in the absence of the PBRF intervention? How do we know that what we now see is a consequence of this policy? No simple response can be made but I will return to this (Section 6: Closing remarks).

It is widely recognised by Governments worldwide that a healthy research base is desirable because R&D is associated with business competitiveness, economic growth and broader benefits that contribute to the quality of life through health, social and cultural outcomes. For these reasons, the European Union in its Lisbon Agreement of 2000 set a target expenditure of 3% of GDP on R&D, a significant increase for most of its members. At much the same time the USA expressed concern over the perceived risks of declining performance in science and technology. And all nations take note of the strong emerging profiles of China and India as contributors to global research.

In the 1980s there was a perception in some countries that knowledge, and research outcomes, could be sourced from elsewhere. Now, we recognise that an advanced knowledge base is a requirement if we are to have the capacity to acquire and use that external knowledge.

“The model of native research knowledge is important. There is a cost to not having the capacity to import and use knowledge. New Zealand is almost on the cusp of losing this.” *Director, Clinical school*

It is therefore unsurprising that the government of New Zealand took steps to address the relative performance of its own research base. The PBRF was one of the key recommendations set out in the Fourth Report of the Tertiary Education Advisory Commission (TEAC, 2001) and accepted by government. It provided a route to selectively allocating limited research resources to those TEOs which could be seen, by a number of criteria, to be carrying out the greatest volume and highest quality of research.

Research excellence might be desirable in its own right, but TEOs are not the only organisations that can deliver research (although there is a strong evidential argument that university-based national research systems are more effective than institute-based systems: May, 1997; Adams, 1998). What TEOs uniquely deliver is people. They are the only source of very highly-qualified people who can respond to the demands of an increasingly knowledge-driven economy. As the Tertiary Education Strategy (MoE, 2007: page 38) notes, what research excellence can do is to create the environment in which knowledge-based skills and competencies can develop.

We should therefore also consider the extent to which the PBRF addresses this critical outcome, and note that research in support of teaching has been explicitly identified (TEC, 2005: page 12).

2.1.2 Intervention logic

A useful deconstruction of the desirable characteristics of the post-PBRF system is found in the intervention logic developed with the TEC as part of the PBRF design. The intervention logic is described in full detail by Duignan (2005) and is summarised in context by Campbell et al (2006: Chapter 4). I shall discuss evidence that shows whether this has proved effective in a later section (Section 3.1.2: Intervention logic).

2.1.3 Objectives in practice

In the light of material available and in response to discussion with key informants, three key types of outcome emerged. (Note that ‘formative and summative’ are also used to describe evaluation processes, which is why they suggest themselves here in a parallel context. This is unlikely to confuse an informed reader, but it is a point about which they should be aware).

The first objective of the PBRF process is to reward excellence via the selective distribution of resources from the fund. The outcomes of the assessment process provide metrics for a **funding** allocation model. This affects the volume of resources available to researchers.

The same quality-metrics, obtained at the level of individual researchers, are combined to provide a second, summative and **reputational**, outcome. The metrics are averaged across researchers within subject-based groups within an institution and then across subjects to provide a report for the institution as a whole. This increases the level of information available about relative research performance within and across TEOs.

The funding and reputational outcomes can be important drivers for a third outcome, although the act of participation in the PBRF assessment process may be an equally important influence, and that is the **formative** outcome. This leads to changes in behaviour for individuals and their organisations.

We can thus evaluate the PBRF process and objectives against these three kinds of outcome. However, we might also wish to consider whether they are in themselves sufficient or whether there is another layer of objectives which is being missed.

Can research quality be an objective in its own right or is it a 'good thing' because it confers other, more fundamental or emergent, characteristics? If the latter, then evaluation should consider whether there is follow-through to that deeper layer of objectives or whether any part of the process is tending to constrain such development by the focus on the proximate outcome of individual excellence. I believe that the most likely 'emergent characteristics' to consider for TEOs are associated with the nature of the training environment and the sustainability of centres of current excellence.

Finally, we should acknowledge that government policy is not independent of other 'signals to the system'. Ascribing responses uniquely to a particular stimulus may be futile, but a portfolio of correlated causes and effects may hopefully constitute an acceptable basis for reflection.

2.2 Characteristics of the PBRF assessment process

I will draw attention to some particular features of the PBRF assessment process. This discussion is selective and focuses on those features that were most frequently discussed in meetings during the review and to which I shall later refer. For a fuller description of the assessment process, readers not familiar with the New Zealand system should consult the TEC's (2005) guidelines for and (2007) report of the 2006 assessment cycle.

The performance-assessment model recommended by TEAC (2001) and chosen by the government is described as a mixed-model, because it uses both a cyclical quality-rating (using evidence from staff portfolios) and two annual volume-based components (using ERI and RDCs).

2.2.1 The nature of research

The model underlying the TEAC's (2001) recommendations is distinctive and familiar. It is one that has been thoroughly tested in other countries, and has been cited as having contributed to the improvement of relative research performance in the UK (Adams and Smith, 2006). It therefore comes to New Zealand with some strong endorsement, but it should not be seen as a neutral model.

The model underlying the PBRF assessment is one that resonates most strongly with a conventional western scientific paradigm. This is not a criticism. It has, after all, led to a wide range of those things that underpin modern economies and contribute substantially to national wealth and, arguably, the quality of life of many people.

It does mean, however, that it is not a model that will respond as readily to research that is less consonant with that scientific paradigm. For New Zealand, as for all national systems, this means that we need to reflect on how well it can encompass different modes of research (both basic and more applied, translational, policy-orientated and practitioner-related), different fields of research (including the social sciences, the humanities and creative arts) and different research cultures (including Māori and Pasifika).

I am particularly grateful to staff at the TEC, at the wānanga I visited and in TEO departments, and to Te Kahui Amokura who were able to help build my understanding of the contexts which distinguish western and Māori approaches to knowledge (Mātauranga Māori, including Te Reo Māori), research (Kaupapa Māori) and innovation. I am also conscious that this understanding remains limited and I tread warily where I tread at all. I will return to a discussion of this later (Section 4.5 : Māori and Pacific).

2.2.2 A definition of research

TEC (2005) guidelines define research as:

“For the purposes of the PBRF, research is original investigation undertaken in order to contribute to knowledge and understanding and, in the case of some disciplines, cultural innovation or aesthetic refinement.

It typically involves enquiry of an experimental or critical nature driven by hypotheses or intellectual positions capable of rigorous assessment by experts in a given discipline.

It is an independent, creative, cumulative and often long-term activity conducted by people with specialist knowledge about the theories, methods and information concerning their field of enquiry. Its findings must be open to scrutiny and formal evaluation by others in the field, and this may be achieved through publication or public presentation.

In some disciplines, the investigation and its results may be embodied in the form of artistic works, designs or performances.

Research includes contribution to the intellectual infrastructure of subjects and disciplines (eg. dictionaries and scholarly editions). It also includes the experimental development of design or construction solutions, as well as investigation that leads to new or substantially improved materials, devices, products or processes. “

Each of the PBRF’s twelve subject-specific peer-review panels provided its own elaboration of this definition of research, which was published in the guidelines. As an example of the breadth of coverage, I would refer readers particularly to the descriptors developed by the Māori Knowledge and Development Panel.

My attention was drawn, at a focus group meeting with PTEs, to a divergence between the TEC research definition and that used elsewhere, for example in teaching quality assurance. It was said that the New Zealand Qualifications Authority Mana Tohu Mātauranga O Aotearoa (the NZQA) has modified its previously different research definition as part of the 2006 tertiary education reforms. Certainly, these definitions need to be consonant to be meaningful, and this is particularly relevant when considering research assessment in non-university TEOs.

2.2.3 Individual basis for quality assessment

The key quality-related element in the PBRF model is the EP (Section 2.2.5: The Evidence Portfolio (EP)) submitted by individual researchers. This individual focus is a distinctive feature that differentiates the New Zealand system from that used in, for example, the UK Research Assessment Exercise (RAE) or in the Australian quality assessment.

The focus in most national and institutional research assessments has been on the research group, with evidence being collated across individuals in that group. The size and definition of groups is variable, but individual assessment has generally been assumed to be more appropriate to performance appraisal and detailed management processes than to systemic assessment.

This is an important difference. There will be particular outcomes of the PBRF that will differ from other national models because of this finer granularity.

2.2.4 Researcher eligibility and categories

The PBRF is inclusive and comprehensive. The background driver for inclusion is the expectation enshrined in the Education Act 1989 that academic staff teaching on higher education degrees (including graduate certificates and diplomas) should necessarily also participate in research.

The expectation is that anyone who contributes to the learning environment at degree level, and who will thus have a requirement to teach as part of their contract, should participate. There are, however, 'substantiveness' criteria which are applied so that anyone employed for less than one day per week or for less than one year in total would fall below the PBRF threshold.

The consequence is that a diverse portfolio of staff will be included in the PBRF net, including not only the core of permanent academic staff but a variety of other individuals who may from time to time participate in teaching. This could include, for example, research assistants who support their supervisor's courses, so long as they meet the substantiveness criteria.

The PBRF acknowledges a category of 'New and Emerging' researchers for those individuals who became eligible during the relevant census period rather than at a prior date. Inevitably, staff submitted to any assessment range from those who are old and experienced to those who are relatively new to the academic or research environment. Researchers at an early stage in their careers will have much sparser track records than well-established individuals. It has therefore been argued, and government has accepted, that if they are to be evaluated individually then they should be evaluated against a somewhat different benchmark.

2.2.5 The Evidence Portfolio (EP)

Individuals are expected to compile their own EPs, although this may be managed centrally.

The portfolios have three components:

- RO – research outputs. Each researcher may nominate up to four outputs (NROs) as well as listing up to 30 other outputs. These outputs must satisfy the PBRF's definition of research (above) and must have passed a formal quality-assurance process. The TEC (2005: page 43) provides a list of research output types.
- Note that researchers are expected to identify their fractional contribution to any co-authored research output. No assumptions are made regarding order as an indicator of importance, nor of equality among authors.
- PE – peer esteem. This could be a list of markers of the esteem in which the researcher, or their research work, was held or an explanatory statement to the same effect.
- CRE – contribution to the research environment. This could be a list of markers of the researcher's contribution to an effective research environment or an explanatory statement to the same effect.

The TEC (2005) guidelines provide extensive examples of the sorts of evidence that would be appropriate for the PE section (pages 54 – 57) and the CRE section (pages 58 – 60).

The assessment process scores each component, applies a rating on a 0-7 scale, and then weights and sums these to deliver an overall mark. The peer review panel then used this as a primary guide in assigning a Quality Category ("A", "B", "C" or "R").

New and Emerging researchers may be assigned a variant category "C(NE)" or "R(NE)", where "C(NE)" requires slightly less stringent criteria than for other staff. New researchers meeting "A" and "B" criteria are not distinguished from other staff.

2.2.6 Assessment panels

The EPs are submitted to a panel of experts for peer review (Annex 3: Peer review panels).

There are twelve panels, and the range of subject areas under each panel is identified (there are 42 subject areas). The diversity of panels is small compared to the UK system, which

has 68 panels. There is, for example, just one engineering panel while the one for health also covers dentistry and veterinary science and the different one for medicine and public health overlaps with the biological sciences panel.

TEOs also identify staff by 'nominated academic unit' for the purpose of reporting aggregated results. These units need have no logical correspondence with the panels or subject areas (nor with any real-world entity).

Interdisciplinarity, it might be assumed, would be readily absorbed within the broad nature of these panels and cross-referrals between panels might then be rare. In practice, this turns out not to be the case and that is almost certainly a consequence of the individual nature of the assessment.

Because EPs are individual, rather than for a group or department, it is possible for different panels to review EPs from staff who work together. Thus, two chemists might find that one had been reviewed by the physical sciences panel (covering chemistry) and one by the engineering, technology and architecture panel (covering chemical engineering). Conversely, TEOs may find staff being reviewed by a panel where they have no corresponding academic department.

The employing TEO is expected to nominate a primary panel that best corresponds to the individual's field of research, both in terms of the content of their EP and their recent activity. Staff may ask for their EP to be cross-referred. EPs are also re-directed by TEOs to a panel other than that initially proposed by a researcher and by the TEC, in concert with panel chairs, to a panel other than that initially proposed by the TEO.

This pattern will, of course, create issues in reporting.

2.2.7 Assessment process

The peer-review panels each included a number of relevant experts drawn from the New Zealand and international research communities. There were a total of 172 individual members in 2006 (TEC, 2007: Appendix B), of whom more than two-thirds had prior experience in 2003. Most panel members were drawn from national universities, and most overseas members came from Australia or the UK.

Each panel determines its own research definitions and variant set of criteria, based on the core PBRF criteria and nuanced to respond to the characteristics of the disciplines for which the panel is responsible. The panel-specific guidelines for the EPs are set out in detail in TEC (2005) guidelines.

Panels only met on a limited number of occasions, because of the difficulty of convening meetings. Panels were able to cross-refer EPs to other panels and they were able to draw on specialist advice.

Each EP was reviewed by at least two panel members. Each component of an EP received a score. Scoring included preparatory, preliminary, cross-referral and calibrated stages to increase the likelihood of an informed consensus. Scores were then weighted and combined to produce a total weighted score. This was then related to an indicative quality category.

The total weighted scores finally agreed were used as a primary guide to quality but not as the sole criterion for the panel's judgment which took into account special circumstances and an holistic overview of the EP.

2.2.8 Moderation of panel outcomes

It is inevitable that different disciplines are likely to take somewhat divergent views of what might constitute national as opposed to international or local research quality. A moderation

process was therefore applied to ensure consistent standards across panels as well as to ensure strict adherence to the published guidelines.

A moderation panel met twice to review cross-panel scores. Individual members also visited subject-specific panels to oversee panel processes.

2.2.9 Quality weightings

The panel judgments led to the assignment of a quality grade: “A,” “B,” “C,” “C(NE),” “R” or “R(NE).”

To be assigned an “A” it was expected that the researcher had produced research outputs of a world-class standard, established a high level of peer recognition and esteem within the relevant subject area of their research, and made a significant contribution to the New Zealand and/or international research environments.

For a “B” it was expected that the researcher had produced research outputs of a high quality, acquired recognition by peers for their research at least at a national level, and made a contribution to the research environment beyond their institution and/or a significant contribution within their institution.

A “C” would normally have produced a reasonable quantity of quality-assured research outputs, acquired some peer recognition for their research, and made some contribution to the local research environment. “R” researchers are those who do not meet this requirement.

These quality grades were then converted to quality scores for entry into the funding allocation formula and for the purposes of reporting.

Quality weighting factors were “A” = 5, “B” = 3 and “C” (and “C(NE)”) = 1.

2.2.10 Subject weightings

Subject-area weightings were also used for funding, based on the primary subject area of research to which an EP was assigned.

Table 2. The subject-area weightings in the PBRF funding formula

(See TEC, 2007: Table 8.2 for full subject detail)

Weight	Subject areas
1	Humanities and social sciences
2	Natural sciences, information science, visual and performing arts, design
2.5	Engineering, agriculture and applied biological sciences, architecture, design, biomedical, clinical, pharmacy, public health, veterinary sciences

The rationale for these ratios as weightings of research activity could be policy-driven or cost-driven. They are in fact based on the differentials between the top ups added to Equivalent Full-Time Students (EFTS) for research-based postgraduate degrees (TEC, 2005: page 27). That is an interesting rationale, but it refers to teaching and not to research costs. I will discuss this again in the context of possible changes (Section 5.13.3: Weighting factors – subjects).

2.2.11 Reporting

For reporting purposes, the individual EP scores were summed (by subject or by nominated academic unit), multiplied by 2 (so an “A” becomes 10), and then divided by the number of FTE-weighted staff.

Reporting is conveyed primarily through the TEC (2007), the report on the 2006 assessment. This document lists: various summary analyses, tables by the 42 subject areas for each TEOs’ staff by grade and average score, tables by TEO for each nominated academic unit’s staff by grade and average score, and other background analyses.

As noted in relation to EPs, the individual nature of the assessment means that some staff from a single unit within a TEO may have been assessed by different panels and under different subject areas. Mapping between subject tables, nominated academic unit tables and physical entities on campuses can therefore be an intriguing puzzle.

Reporting does not require information about individuals, which remained confidential. Individual scores were made available to staff, however, and in confidence to a central office in each TEO.

2.2.12 Component mix and weighting

The consequence of mixed indicators for the PBRF is that only part of the funding allocated from the fund is dependent on the cyclical quality measure.

The positive side of this is that the New Zealand system is more flexible than other national systems. The data on income and training outputs are updated annually and so organisations that are more successful in those respects have an opportunity to influence their income year-on-year.

Offsetting this flexibility is the degree to which funding is only partly influenced by the quality measure. It is useful to disaggregate the PBRF structure and weighting factors in the model.

Table 3. The current formula weights for the components of the PBRF assessment

Main component	Weighting 1	Sub-component	Weighting 2
Researcher’s evidence portfolio (EP)	60%	Nominated research outputs (NROs)	70%
		Contribution to the research environment (CRE)	15%
		Peer esteem (PE)	15%
Research degree completions (RDCs)	25%		
External research income (ERI)	15%		

It will immediately be apparent that the component most readily associated with research excellence, the quality of the nominated research outputs (NROs), actually accounts for less than half of the overall weighting (70% of 60% = 42% overall). The PE element should also be related to overall research quality but CRE may be high and valuable without representing international research quality.

Because RDC and ERI components refer to activity and inputs they are not necessarily measures of quality, let alone excellence. However, RDCs indicate the production of highly-skilled people and, if associated with research quality, then they create an important benefit. The ERI component is a bonus for successful grant applicants, and enables them to foster additional curiosity-driven research.

3 Effects of the PBRF on the tertiary education sector

The PBRF and the associated research assessment process are intended to stimulate research excellence within TEOs so as to produce an overall improvement in the relative international performance of the New Zealand research base. This section looks at outcomes in relation to key objectives (Section 2.1 : The objectives of the PBRF). Successive sections look at systemic effects.

3.1 PBRF objectives

I believe that it is evident that the PBRF has been effective in achieving all three of the main types of outcome (financial, summative (reputational) and formative) that I identified earlier.

- Research resources are now directed more selectively to those institutions judged by the PBRF process to have delivered better research.
- There is now more and better information about relative research quality at institutional and subject level.
- There have been significant changes in the management of research, in research culture and awareness and in the priority given to research activity.

It is reasonable to expect that these outcomes will lead to an overall improvement in the performance of the New Zealand research base and in the country's relative international standing.

3.1.1 Improving research quality

It is too early to make any comprehensive assessment of changes in underlying research quality, although the general tone of remarks is positive.

“A genuine, small, absolute gain” [in research achievement]. *Deputy Vice-Chancellor (Research)*

In the UK, with the benefit of twenty years data, it is possible to see that relative research performance (measured by, for example, global share of citations to journal articles) began to improve two-three years after the first research selectivity exercise in 1986. This analysis is made more convincing today, however, by a retrospective trend across a much longer period. Five years after the first PBRF round, and with a smaller system, no quantitative judgment about New Zealand can yet emerge.

There was a measurable improvement in the quality evaluation produced by the PBRF in 2006 (an average score of 2.96: TEC, 2007 – Table 5.2) compared to 2003 (average of 2.59). The components contributing to this aspect of research performance have been extensively analysed by Smart (2008: Research par excellence) and the partial nature of the 2006 round meant that it was more likely that grades would improve than otherwise (J Boston, pers. comm.).

It would not be sensible to take the 2006 outcome as evidence that research activity improved compared to 2003. First, the time span is far too short to assess meaningful change. Second, many of those electing to enter in 2006 did so in expectation of submitting better evidence of their quality while those who had previously done well chose not to be reassessed. Third, and more importantly, the system was in transition.

The improvement in 2006 compared to 2003 was primarily due to better presentation rather than an underlying change, but this is no bad thing. A rapid re-assessment provides an opportunity to build on the wake-up call that the 2003 round represented. What the apparent improvement means is that in a relatively short period there had been a sea-change in the

focus given to research activity, and this resulted in better identification of relevant indicators, better structuring of the information for assessment and a greater willingness to acknowledge and promote research success alongside other activity.

Where intention leads, achievement follows. Initial gains can be made by cosmetic modification and more sophisticated use of the available evidence, but further improvement can only come from a real step-up in activity and TEOs are entirely aware of this.

In due course, external and independent indicators, such as those used by *Evidence* (2007) for international comparisons, will test whether or not the indicative outcomes have led to real relative improvement.

3.1.2 Intervention logic

Campbell et al. (2006, Figure 4.3) unpacks the TEC's intervention logic diagrammatically and from this summary we can see that the 'outputs' are clearly being met by the PBRF methodology.

Figure 4.4 analyses the position with respect to external research funding. One of the immediate outcomes is the better information to research users about research quality and topics. This can be further tested by the increase (if any) in external research funding, which we should also note ought to be logically directed towards the better performers. Figure 4.5 analyses the position on increased quality and excellence. The outcomes of reward should be threefold: increased quality across the system; increased world-class research; and a 'sustainable' research system. These are not independent and may actually be conflicted. What is to be sustained? The increase in excellence may only be sustainable at the expense of that research activity which is less excellent. How will it be sustained? The focus on individual excellence must also provide flexibility for those whose careers are still developing.

The outcomes are achieved via intermediate steps analysed in Figure 4.6 (highly motivated researchers) which is in itself driven by the analysis in Figure 4.7b (supportive research environment). This gives two positive outcomes. I will provide evidence to show that there is now clear strategic and planning direction and effective organisational structure in many TEOs. What is less readily assessed is whether the PBRF sustains effective networks and alliances, and there is some evidence to suggest that it works against such collaborations. Furthermore, the focus on individual excellence may work against the objective of achieving appropriate and diverse types, skills and levels of researcher.

3.1.3 Rewarding research excellence

Smart and Smyth (2008) and the report on the 2006 assessment (TEC, 2007) provide much information to show that resources are now allocated in line with quality evaluation (QE), ERI and RDCs. Research funding increases are associated with those university institutions that are judged by peer review to have the highest quality activity.

Smart and Smyth (op. cit.: Table 2) have provided an excellent analysis which reveals the extent to which the PBRF has shifted the share of research funding distributed by the TEC towards the universities and away from ITPs, wānanga and PTEs. Within the university sub-sector there have also been considerable shifts in the balance of research funding.

Most researchers in all types of institution supported the current objective, of rewarding excellence in all locations. Rewarding research excellence wherever it occurs is, however, a problematic aim. While it seems superficially to be a 'motherhood' statement, it carries the implication that good activity must be supported even if it arises in an essentially research-weak location. Is this desirable? As a proximate reward there is little problem but the long-term implication is that research capacity can grow all over the system and, where resources are limited and the system is small, this can only occur at cost to existing centres of

excellence. A solution to this problem would be a policy decision to take some institutions out of the PBRF, but this has obvious implications.

There has, of course, been some increase in the total funding available to the sector during the transition from the former head-count basis of funding (research top ups, RTUs) to the PBRF but Smart and Smyth (op. cit.: Table 1) show that the universities share of PBRF funds (97.6%) measurably exceeds what they would have acquired had RTUs remained in place (91.4%). The biggest gains were seen by the Universities of Auckland and Otago, which were the institutions with the highest average score in PBRF 2006 (Smyth and Smart, 2008). The main 'losers', in conceptual and sometimes financial terms, were the ITPs, with 2.1% instead of 7.4% of available funds.

There is also quasi-independent evidence that funding has shifted towards institutions with relatively high-quality research publications. The indicator most frequently used as a proxy for research quality in international comparisons is the citation impact of journal articles catalogued by Thomson Reuters, publishers of eg. the Web of Science. Indicators derived from publication and citation data are called bibliometrics. Smart and Smyth (2008) report that bibliometric analyses show that the impact of those New Zealand TEOs that have increased their funding share is entirely comparable with, for example, the G8 leading Australian research universities (also, Smart and Weusten, 2007).

3.1.4 Research and funding in support of postgraduate teaching

Smart and Smyth (2008) confirm that PBRF allocations are aligned with RDCs. This is a more efficient way of directing resources towards the most effective postgraduate training organisations than simply funding places. It provides an incentive for TEOs to make sure that projects are properly planned in the first place and are then properly managed so that students complete in a timely fashion. Indeed, Smart and Smyth (op. cit: Table 6 and page 5) comment that "RDC and ERI produce greater variations of performance [between universities] and thus are more important drivers of funding shifts".

TEC (2007: Figure 8.1) also shows that the funding stream for RDCs is aligned with the QE funding. The greatest concentrations of postgraduate students (as RDCs) are associated with research-rich training environments (as QE). The RDC/QE ratio overall is around 0.4 but in universities can be as high as 0.5.

3.1.5 Improving the quality of public information

A global desire for more information about the relative performance of publicly funded bodies, including TEOs, is reflected in the league tables published by leading media agencies including the Times Higher Education Supplement, as well as by individual institutions. It is right and proper that bodies like the TEC, with some oversight of national systems and access to useful data, should place well-informed reports in the public domain.

TEC (2007) – the report on the outcomes of the 2006 assessment – is a substantial compendium of new information about research performance within and across TEOs. The mapping of this information to units within TEOs is a reasonable use of information which some institutions seem to seek to frustrate but, compared with what would previously have been available to observers, this is a profoundly useful volume.

"The score allows the country to evaluate what we do." *Head School, Science*

The significance of the information that the TEC now reports is reflected in the exploitation by TEOs of other media. Many observers drew attention to the public relations blitz that followed the 2006 results, as some TEOs strove to assert their primacy. Whether claims were justified is not for discussion here. What is notable is that the TEOs themselves believed that this information was significant and that it was valuable to draw it to public

attention. It was a convincing public statement of their relative position, whether or not they always accepted the validity of the fine differences.

3.1.6 Summative reputational outcomes

The public information in TEC (2007) is derived from the analysis of QE scores of individual researchers aggregated at subject and institutional level. These summative outcomes are one of the three key outcomes identified at the start of Section 3.1 : PBRF objectives.

The significance of this outcome is reflected, as noted, in the reaction of the institutions. Reputation is a very powerful driver: for senior management, for departmental leaders and for individual researchers. The relative position of some institutions after the 2003 round was evidently a spur to redress their deficit position by better management of their submission in 2006.

There is widespread agreement across the sector that the summative outcomes are a fair judgment of relative standing. That is to say, the relative scores at subject level are perceived to be 'about right' in terms of the ranked placing of the institutions submitting within a subject. This is important to know, because there is much less consensus about individual scores:

"The anomalies caused a sense of outrage; you couldn't counsel them." *Head of department, Social science*

"I trust the panel to get the overall judgment right, but not always for individuals." *Deputy Vice-Chancellor*

"Reliability at an individual level is erratic. You get false positives and false negatives." *Vice Chancellor*

"There were some odd results for people, but we think the order in the [subject] table is about right." "Yes: we agreed about that." *Focus group, Science*

"... and the only thing people wanted to know was whether the Department was top or not." *Head of department, Engineering*

Staff pay attention to these summative results, and they anticipate that others will also look at the relative scores.

Researchers will be drawn to the higher-ranked units, which will find it easier to recruit new staff. Research funders are likely to refer to the scores as well: covertly for public sector funding but explicitly for industrial contracts. There may be further concentration of research quality, reinforcing the initial assessment outcomes.

Smaller TEOs also perceive that the PBRF outcomes have reputational effects for them, though the effect of this is not always the same. It was suggested to me that the most evident effect is not to change student opinions of the status of an institution, but to affect the views of community stakeholders who can take the 'league tables' very seriously. The real, tangible value of the outcomes tends to be hard to pin down: a non-R PBRF grade was described as 'the cherry on the top, not the icing let alone the cake'.

3.1.7 Preventing undue concentration

There is a tension, noted earlier, between rewarding research excellence and constraining the concentration of research resources. Concentration is one mechanism expected to lead to an increase in the average quality of research, by adding support to existing excellence, but it implies that choices are made about what will NOT be funded. Over-concentration can starve the emergence of innovation and reduce desirable diversity (Stirling, 2007). Over-dispersion results in too few resources being available to address research opportunities while too many resources are allocated where they will have little benefit.

A risk inherent in attaching reputational labels is that, unless these are regularly reviewed and revised, they become fixed and reinforced by the behaviour of the rest of the system. Fortunately, Smyth and Smart (2008) find that comprehensive analyses of currently available data reveal no sign at present of undue concentration in the New Zealand system compared to the Australian university system.

Smyth and Smart (op. cit.) note that about 60% of research articles published in New Zealand are produced by the seven universities, and most of the balance comes from the Crown Research Institutes (CRIs). For comparison, in the UK, about 84% of articles come from the Higher Education (HE) sector and about 68% of that HE output (about 60% overall) is produced by 56 pre-1992 universities (polytechnics became universities and accessed core research funds after 1992) (data from *Evidence Ltd*).

Further concentration is very likely to occur. It would be naïve to suppose that this will not happen and it would potentially be problematic to introduce a formal 'limit' to concentration. There would, however, be effects on an already thinly-spread geographical network of tertiary provision and on the diversity of activity.

It is a matter for informed judgment to determine when the right balance is achieved between dispersion and concentration. A number of interviewees commented on the question of "how many universities can New Zealand afford?" On the one hand it seems undesirable that there should be any reduction in the present number, which could only be done at some cost to a system in which some subjects are already represented by relatively few contending schools. On the other hand the existing institutions are already resource-constrained and many research opportunities are going begging for lack of funds, if the current high rate of applications and low rate of awards from the Marsden Fund and the Foundation for Research, Science and Technology (FRST) is a reasonable criterion. It is unreasonable to stimulate research prioritisation and then be surprised that more people are seeking funding.

There is no 'right answer'. It may be that there should be a more open discussion about the 'right size' and the 'right structure' of the New Zealand research base. This is a global debate and France, for example, is similarly coming to terms with the need for wholesale reform of its research organisation if it wants to compete with other leading research nations in Europe.

3.2 Research culture and management

This section is about the formative outcomes of the PBRF process. Are there particular strategic or management changes in TEOs that have occurred because of the PBRF? How has the PBRF affected the management of research resources?

Improvements in performance may be achieved through changes in institutional structures and through individual work patterns. In fact, structural change may be more detectable than cultural change. Both are likely to precede measurable change relative to international research quality.

We must be careful, however, in identifying change as effect. Major policy initiatives are the outcome of widespread discussion and the emergence of broad consensus. Observed changes may be as much a concurrent response to that consensus as to the specific stimulus. The two are associated, but not directly and specifically linked.

"In the 1980s the department was weak ... little ERI ... few PhDs ... publication was not emphasised. We were recruited to redress the situation, so the PBRF trailed behind a pervasive cultural change." *Head of department, Psychology*

We should be equally careful to accept assertions that problems in the sector are the consequence of a particular policy or of associated changes. Some problems may have

their origins prior to the new policy and the change may simply have accentuated the issue, or provided a useful scapegoat.

At the same time, any assessment system necessarily creates some administrative load and may have unintended or indirect effects. For example, research assessment may draw attention away from teaching. The need to respond to particular metrics may de-emphasise other desirable outputs from the research process. Researchers may change focus to unduly short-term and predictable goals thought to produce reliable assessment outcomes but which diverge from broader research and economic values (Adams and Smith, 2002). And, as the ARISE reports notes, a “constant hunt for dollars [fosters] conservative thinking” (American Academy of Arts and Sciences, 2008). Such unintended changes need to be monitored.

3.2.1 General responses

The responses to opening questions in interviews provided the most convincing evidence that the PBRF is having a pervasive and profound effect on the status that researchers and managers place on the research mission. Indeed, these formative changes are the ones which are likely in the long-term to lead to the greatest benefit through enhancement of New Zealand’s research performance and the quality of its research and training environment.

“The formative aspect is the most important, driven more by the grading and reputation than by the money.” *Vice Chancellor*

“An extra \$40k is not a lot once it’s divided up, no rubbing your hands. It’s the reputational thing that’s driven them more.” *Head of department, Politics*

The vast majority of respondents were broadly content with the operation of the PBRF and believed that its effects were positive and beneficial. To some extent, the PBRF was unproblematic because it reified prior expectations.

“... a feeling in this department that the PBRF is a good thing.” *Head of department, Psychology*

[The PBRF] “caused much less angst here than the RAE ever did [in the UK]” *Expatriate UK scientist*

“The results here totally reflected what was apparent beforehand. The [staff awarded] “A”s all talked about it and they were just who you expected. It was salutary.” *Head of department, Engineering*

“The VCs generally think this is a pretty good system; it doesn’t need fiddling with.” *Vice Chancellor*

Of course, warnings about ‘fiddling’ may express satisfaction with local rather than systemic outcomes and there were not only winners but also losers.

“There was a long tradition of getting away with murder ... this has had a good effect.” *Professor, Humanities*

“Expectations of gain are never fulfilled while losses are always amplified. The problem was the universities gained relatively little while the ITPs lost much” *Head of school, Science*

“The losers screamed, they wanted to adjust the results, but in fact the ‘winners’ were those who had been losing out before.” *Vice Chancellor*

It was also noted that the latest policy tool did, unsurprisingly, become the whipping boy.

“They’re blaming the PBRF for all sorts of things, but those problems existed before the PBRF.” *Senior policy analyst*

“There are research structural issues to be addressed, but they weren’t caused by the PBRF and they won’t be solved by the PBRF.” *Vice Chancellor*

3.2.2 The status of research

The views expressed by interviewees leave no doubt that the PBRF has put research in the foreground.

“You can talk about research with pride.” *Lecturer, Social science*

“Research used to be ‘your own work’. Now it’s ‘what I’m supposed to be doing’. It’s become a sign of achievement.” *Senior research manager, University*

“In 1998 we had a ‘research day’ to talk about what we did. The PBRF has enabled a broader and more continuous dialogue.” *Professor, Humanities*

“The PBRF has highlighted the importance of research. We had a good ethos but this brings it to the fore.” *Focus group, Science*

“There was a time when research was ego-massaging; that’s gone completely.” *Head of department, Social science*

“I am more willing to put time into getting publications tuned up for really good outlets.” *Lecturer, Science*

[The PBRF] “encourages all parts of a subject to examine their research content – new voices are being heard.” *Focus group, Social science*

[The international aspects] “make clear to individuals what the benchmarks are.” *Vice Chancellor*

“PBRF emphasises the connection with a global discourse about research, as well as of research within the discipline.” *Research leader, Science*

“Travel overseas used to generate resentment. Now people see that this is what good researchers do.” *Professor, Clinical*

“It’s a mechanism that identifies the research-active groups. There were too many getting money for not doing very much.” *Professor, Social science*

Unsurprisingly, there are also contrary views.

“The PBRF is a big crushing machine, an assertion of a model of academic activity that prioritises research over anything else.” *Focus group, Social science*

“The problem is that the panel’s concept [of excellence] may still not meet the material that we submit.” *Lecturer, Social science*

This latter effect is discussed further below. It impacts particularly on disciplines which have outcomes – and outputs – that fit less easily with the ‘science’ assessment paradigm. There was also a view that the central PBRF model displaces the diversity of disciplinary models and sub-models of research culture.

“Some staff focus on the discipline and wider issues of where we work, and they’ll anticipate that pays off for the PBRF, but the new ones focus on the PBRF at cost to the discipline.” *Professor, technical-professional subject*

Note here the emphasis on the effects of the PBRF on new researchers. At several points in this report there is evidence of an association between prior experience and the response to assessment. It is an association seen by the AAAS in the USA (AAAS, 2008) and by agencies in Europe. The explanation is that it takes time to acquire confidence in research, to understand the community’s vocabulary and ethos, and both early-career researchers and those in institutions with an historically less active research profile found the PBRF much more challenging than established staff in research-intensive universities.

There was concern in the original discussions around the PBRF that an emphasis for research would then displace other necessary academic activity, such as teaching and administration. Opinions on this as an outcome were varied but on the whole the view was that the post-PBRF balance is probably a better reflection of a desirable position in relative international terms. Few saw the change as negative.

“The effect on teaching is a valuable rebalancing, a shift away from a volume emphasis.” *Senior management team, University*

“No evident impact on teaching, but there has been a deliberate rationalisation of courses – which was possibly overdue because we had some unfeasibly small classes.” *Head of department, Science*

“People look at three years as HoD: not enough time to make an impact but enough time to lose [research] impact.” *Senior researcher, Science*

“Senior staff are reluctant to take on additional administration because they need to focus on research activity.” *Research manager, University*

“There is a greater reluctance to take on administration tasks.” *Head of school, Science*

Perhaps surprisingly, however, some staff actually chose to adopt new administrative roles in order to fulfil CRE requirements (see below).

Very similar comments to those quoted above about teaching were made across the focus groups, especially in science, and by more than two-thirds of the interviews with individual academics. The overwhelming view was that the previous system had unduly emphasised student-volume as a key driver and that this had displaced other activity and led to the marginalisation of research. Indeed, the ‘quantity’ aspect had not placed any value on ‘quality’ even for teaching. The PBRF not only positioned research back in the centre but reaffirmed the significance of excellence in all knowledge-related activity.

There is a risk that the PBRF model over-promotes a particular research outcome, one that most easily fits perceived benchmarks.

“You need to engage with the process to encourage reflective scholarship. [The PBRF] is developing interest and enthusiasm but you can too easily get into ‘stamp collecting.’” *Research management team, University*

“[The PBRF] is a more effective tool to create more bangs per buck, but it works against a humanistic approach.” *Focus group, ITP*

But there was also a warning about relying on historical concepts of what universities do when they do research.

“The assertion that ‘great scholars’ would not have done well in the PBRF is invalid. Anyway, the research culture has changed – resources, community, size, access, communication.” *Professor, Humanities*

And an important nuance was raised about momentum: would the successive cycles of PBRF be able to keep the change process going?

“Our Department took the PBRF seriously, we needed to get on a virtuous cycle. But now there’s a reaction. The individual results swamped the Departmental achievement – A’s great, B’s disappointed, C’s depressed.” *Head of department, Social science*

To conclude, the balance of view was that the PBRF had, as anticipated, changed the status of research and given it a prominence it previously lacked. This had indeed led to some diminution of emphasis on other activities but that meant an appropriate rebalancing for teaching, a mixed outcome for administration and a sharpened consciousness of the place

of 'excellence' across academic activity. There was concern about whether the change could be sustained and I will discuss the issue of resources and momentum later.

3.3 Changing structures

3.3.1 Institutional organisation

The costs of the PBRF were seen as high initially. This is in part because of start-up costs for new systems and in part because of a learning curve associated with new ways of operating at all levels. All such costs may come to be seen in the longer-term as investment leading to more tangible benefits than appear at the outset.

WebResearch (2004: Chapter 4) compares Hong Kong and the UK and concludes (par 461) that per FTE average New Zealand costs are lower than contemporary estimates for the UK (THES 18 June 2004). It notes high initial investment costs in becoming prepared for and familiar with the system, so costs fall once good practice is established. It concludes that PBRF costs are less than in a competitive bidding process. The report proposes a 2% compliance limit but it fails to acknowledge some unavoidable fixed costs (for the TEC as for the Higher Education Funding Council for England (HEFCE)) which may make such a ratio inappropriate.

An early benefit is that internal research management becomes more effective than before, resources are used more efficiently and thus the costs can be attributed in large part to normal institutional operations. Compliance costs may appear to rise as the task is taken more seriously and new systems and practices are put in place. If the pattern outside New Zealand is followed, then they will later become absorbed as 'business as usual' rather than the periodic, marginal requirements of the PBRF.

Those with prior experience of systems outside New Zealand felt that the costs were already overplayed by some colleagues.

"People say it's time consuming, but it's not compared to the work that we did at [o/seas research organisation] to get a grant. You should keep your CV up to date anyway." *Head of research group, Science*

Some interviewees already recognised that 'PBRF cost' was partly down to initial compliance that would not be recurrent. Developing and learning about new data systems was an obvious and frequently offered example. There were already observable local benefits in better systems and better practice.

"Huge initial start-up costs in preparing for the exercise. Now everybody keeps their information up to date." *Research management team, ITP*

"There was a bureaucracy of compliance and opportunity costs, but these are probably now reducing because people are up to speed." *Director, Clinical*

"We have a new research management information system – [named product]. We convert this locally into management reports and then link it to the HR strategy." *Research manager, University*

Many of the universities and some other institutions have adopted, or are now engaged in developing, research management information (RMI) systems. In this they are following a global trend as well as responding to the PBRF. It is important that the RMI systems that are adopted work to general benefit. They should both enable more frequent and detailed reports to be produced for management and also have valuable spin-offs for academics. For example, the software required to assemble the EPs should be flexible enough to allow customised formats that deliver each researcher's CV in the style they prefer. Not to do so is a time-wasting disincentive.

The arrival of the PBRF has been associated with a universal and substantial refocusing of institutional strategy around the research mission and the development of a number of mechanisms to support that strategy.

“Our nominal School research committee became reified and functional. It galvanised us into a more formal attitude to research quality.” *Professor, Creative arts*

There are parallels between the changes seen in New Zealand and those seen in the UK in the 1990s. An important difference, however, is that the changes in the UK lagged the introduction of the RAE by some years, as the HE research base recognised and accepted new imperatives. In New Zealand, changes observed in other countries, including not only the UK but other parts of Europe and Australia, have enabled the TEOs to begin the change process of their own volition and in anticipation of governmental change. This anticipatory change means that the relationship between new research management and the PBRF is ‘fuzzy’. As noted earlier, both sides of the system are responding to a general consensus about the best way of delivering good research.

The PBRF has focused the attention of management teams on the link between excellence and funding.

“Our strategy did not change but the accent was shifted by the PBRF.”
Management group, University

Our research fund has been reinstated. It had been allowed to lapse. Now there is a new and deliberate strategy to allocate funding selectively, to get pump-priming but with a strong emphasis on excellence.” *Research manager, University*

[The PBRF] “improved recognition of the value of research for the University, [they saw] that income was not only T-linked. It became important to their accounts.” *Head of department, Science*

Otago Polytechnic provided a comprehensive overview of its evolving research strategy. This followed a structured progression, with a shift from ad hoc researcher activity to planning and acquiring funding for those plans. The research strategy has specific plans for each ‘school,’ research mapping, an evaluation of research clusters, more information internally and externally, and thus a better display of strengths. Research support has a full office focussing on grant applications and the research grants committee has been restructured. There are career tracks for R-orientated staff and mechanisms for staff support through incentivisation, sabbaticals and travel scholarships.

Otago is not unique. It provides an excellent example of the pervasive change in research thinking. Other, comprehensive examples exist and will serve the New Zealand tertiary sector well.

I referred to anticipatory change. The University of Canterbury, for example, has a research office with its origin in 1997 but with much growth since 2003 and a new, comprehensive internal and external interface. There is a Pro-Vice Chancellor for each disciplinary ‘college’ and each has a devolved research fund backed up by strategic, central research resources.

Most universities have had a Pro-Vice Chancellor with a research portfolio since the 1990s and some had a research committee as early as the 1980s. These structures continue to evolve. At Victoria University Wellington, the post of PVC (Research) was established in 1998 but after PBRF 2003 was extended to two posts: a Deputy and an Assistant VC.

Other research mechanisms are also growing. The University of Auckland has an internal allocation geared to the PBRF which it initiated in 2003 and ran as a full internal model in 2005. It also has new strategic development funds for research: the senior management team spoke of ‘selective investment to achieve change’.

Changes in research management and planning are seen in schools and departments. Some, such as the Waikato Management School, are building on a comprehensive approach to research oversight that has been in place for some years. School performance-based review started in 1993 and influenced funding allocations across its departments. This produces refined goal-setting and collegially agreed staff targets. The status of every project is tracked.

A similar approach has been spreading across the system as the benefits of conscious and active decisions about research are accepted. At Victoria University, the Dean of Arts introduced a threshold analysis of research activity in 2000 and awarded small research grants.

“People started to modify their behaviour and looked at what the PBRF later called their CRE and PE measures.” *Professor, Humanities*

The benefits of simply “discussing what we’re doing” were referred to. The reason why this didn’t happen in the past was often ascribed to arguably inappropriate, or at least over-emphasised, notions of academic freedom, and the individualism of the lone scholar. When assessment outcomes affect everyone then the freedom to have done nothing is no longer collegially acceptable. Some departments realised after PBRF 2003 that they could gain from sharing good practice in preparing EPs for 2006 and reflecting on what they did.

“We have regular departmental meetings as well as seminars. It was a collective submission, a sharing of approaches, ideas and information: a discussion about a collectively positive outcome.” *Professor, Humanities*

“There was a lot of EP information sharing, so as to look for ways of improvement.” *Professor, Clinical/health*

“The EPs were only seen by the researcher and the HoD [in 2003], but some people had put nothing under PE so addressing this collectively was developmental.” *Professor, Science*

The PBRF, and the associated cultural shift, empowered management to do things it needed, and often wanted, to do anyway but where it had met cultural conservatism and resistance.

[The PBRF was] “a catalyst for doing the things we had thought of doing for a long time. It endorses the criteria we’d like to use. What would have been controversial 5 years ago just sailed through the Academic Board.” *Senior management team, University*

“The PBRF is a mandate to raise the status of research, strengthen the high-achievers and intervene on those who under-perform.” *Deputy Vice-Chancellor*

“The research culture was less strong in the 1990s and I had to push for an internal research committee. Introducing change then became much more feasible because there were these other external signs of change.” *Head of department, Science*

“There was a growing emphasis on the importance of research and a need to respond to international signals but the absence of a mechanism had constrained change. It was a necessary adjustment to the system.” *Professor, Humanities*

“Only the PBRF would have given the necessary leverage to get a rapid change in attitude and outcome.” *Director of Clinical school*

These responses are very similar to those made by senior staff in UK institutions, discussing the effects of the RAE on management structures. The commonality of view reinforces the strength of this as evidence.

There have been particular changes associated with resource management, both of finances and workforce, and I discuss these separately in the next section.

3.3.2 Allocating money and reward

The distribution of financial resources is a central theme of the PBRF. A key policy objective is the reward of excellence: financial redistribution is evident at an institutional level (Smyth and Smart, 2008). What we need to know is how this works out across the system and sometimes it is clear that focused resource management is being implemented at a deeper level.

“There is a marginal gain in resource flexibility, and that gives us opportunities for strategic intervention. There is a sense that the university is able to invest.”
Senior management team, University

[PBRF allocation is] “not enough to pay for blue-skies research but enough for pump-priming exploratory research.” *Deputy Vice-Chancellor*

“There is an acceptance of more targeted local funding.” *Professor, Science*

“The University has a new development fund, pump-priming new initiatives, research and study leave.” *Professor, Engineering*

“There’s more short-term seed-corn which helps to pump-prime. Very responsive, quick funding.” *Senior researcher, Science*

[Strategic funding to the Faculty]“ is very helpful. Three or four people used to get grants from the centre. Now we have a bigger pot and ten times the number of applications.” *Focus group, Creative arts*

The University of Otago has carried out a detailed analysis of the shifts between RTU and PBRF funding at a departmental level which recognises, indexes and thus seeks to address transitional funding issues. A proportion of funds goes to departments just as they earned it but this creates resource gaps for less research-intensive units, so the institution drives change through a balance between earn-out and cut-back. The strategy bears close comparison with the one successfully employed in the UK by the University of Warwick.

This strategy for allocation follow-through and strategic research support does not happen everywhere. This matters, because the influence of a policy of rewarding excellence and incentivising research strategy is reduced if it is not felt throughout the system, if it is filtered out at an institutional level.

“The university has not yet worked out strategically what it’s going to do with the PBRF money. We need a plan to push forward.” *Head of department, Engineering*

“Institutional feedback to the subject is rather mixed in terms of income, so then staff don’t see the value.” *Head of school, Social science*

This is evidence of an emerging and non-trivial problem. The TEO research base is not a command economy; it depends on the individual efforts of a network of self-motivated and self-managing people. To support and comply with the underlying policy, people need to believe that their personal investment will lead to beneficial changes to their research environment, at whatever level of granularity. While this is for each TEO to mediate, it may need the TEC to identify good practice or the PBRF stimulus will be obscured. The feeling that the high performers were not seeing a due return for their efforts was in fact very common.

“Here the system does not benefit the good, it unduly protects the weak. Success has got to flow.” *Professor, Engineering*

“It’s about a grading and that’s good, but it was supposed to be about reward and that’s a huge disappointment.” *Focus group, Science*

“The system is fine; the rewards are inadequate.” *Policy analyst*

“The cost of not getting the reward is a big morale drop.” *Head of department, Humanities*

It is essential that TEO management understands this and implements appropriate mechanisms, but they need resources from the TEC to make these effective. In one research-strong institution I was given both of the following views.

“The marginal gain in departments is greater than the institutional gain.” *Senior management team*

“It is OK to subsidise others but I want to see where the money goes. Unless this is fixed there will be no point in breaking your back.” *Focus group, Science*

I am clear that the problem was not one of the centre saying one thing and doing another. It was a consequence of the low overall level of resources, the prior balance between winners and losers which meant the gains were marginal, and the recent and laudable expansion in research activity.

“We got some money for a central research role but it was not maintained. Research almost became a normal part of what you did but that too dissipated. So it wasn’t embedded, there’s nothing until 2012.” *Senior staff group, ITP*

“By later years ... there was less money available. The pool stayed the same, there were improvements all round, so it was just redistribution without gain.” *Head of department, Humanities*

“‘Overheads’ are now absorbed by operational costs. Something went wrong. The score has gone up but the [PBRF] income has not met projections.” *Head of department, Social sciences*

The biggest problem for the TEC may be one of deciding how it is to satisfy the expectations that the PBRF has initiated. If it does not provide sufficient resources to enable the TEOs to trickle down the benefits of compliance it may render the whole exercise nugatory. This is a key issue that could threaten the longer-term effectiveness of the PBRF.

3.3.3 Managing people

Innovative research is an individually-driven activity and it is right and proper that the PBRF has spurred significant institutional thinking about people management in regard to research.

“In promotion discussion, PBRF is always a focus.” *Deputy Vice-Chancellor*

“[Professional review] wasn’t properly used in the past. This was a back-water and people were allowed to drift. There is now a much greater buzz but there’s a lot more to be done.” *Head of department, Engineering*

“Every staff member now has an annual review. This was spasmodic before but it’s now institutional and formalised. PBRF helped to drive this change.” *Several heads of school in different institutions*

Workload issues come to the fore in discussions. The managers have to strike a balance between enabling and rewarding the knowledge-workers and incentivising those who need to develop their profiles.

“This is a research university. You shouldn’t have even teaching loads and let the place become a sheltered workshop.” *Senior researcher, Humanities*

“Individual behaviour can be disruptive. The “A”s want a reduced teaching-load and the “C”s feel oppressed.” *Head of department, Social science*

Most institutions have recognised that the balance of management effort has to be on low-end performance management because the best researchers generally do not need to be managed.

“Some staff will never do research. We focus on the staff with capability and move resources to give these people room for manoeuvre.” *Head of research group, Science*

Although ‘people thinking’ has certainly started, the development has been patchy and I am concerned that there is intransigence and some wilful misuse of PBRF outcomes as a staff appraisal substitute in the absence of proper internal management (Section 5.12 : Handling metrics from individual EPs).

Many interviewees confirmed that research performance had always been part of academic job specification and recruitment. The PBRF has helped to refine thinking on the ‘who and why’, however, although some of this implies a shift in profile.

“In the past we pragmatically took on staff to teach international students. The research pedigree is now far more important. HR takes this much more seriously.” *Senior research manager, ITP*

“With jobs, we now think about not replacing like-for-like. We look to reallocate workloads to enable the new person to have an opportunity to build on research potential.” *Head of research group, Science*

“There is a conflict with engineering practice ... a change in recruitment from experience to research track record.” *Professor, Engineering*

There is concern, but no strong evidence from the analysis in Çinlar and Dowse (2008), about ‘poaching’ of good staff by resource-rich institutions. A number of people said that academic choices about work location were driven less by salary and more by research opportunity. Some shift of staff between institutions is inevitable and, from a policy perspective, this may be an appropriate part of selectivity and concentration with the most able relocating to the best resource pots.

“Of course there’s poaching: the “A”s are desirable people.” *University Pro-Vice Chancellor*

“There is a trickling wound of departing staff. This will make the institution go backwards.” *Focus group, ITP sector*

Since the PBRF assessment tends to focus on reputation, and hence track record, those institutions that can afford to do so will preferentially recruit older and more experienced staff who bring a strong portfolio with them. One institution described this as “buying your A’s”.

Reduced hiring of junior staff and side-lining of those who do not immediately perform may threaten sustainability. Çinlar and Dowse (2008: page 7) have reviewed data on staff profiles and suggest that junior staff who fail to get an “A” or “B” grading are diverted into more supervised or temporary employment instead of traditional career paths. They note that if this effect is maintained then it would have “detrimental long-term effects on the tertiary academic work force.”

I regard this as an area of significant concern and will return to it in discussion. A profile of age and experience, a pipe-line of personal research development, is significant to the health of the research base. It does not benefit New Zealand “if we are all A’s.”

4 The equity of the PBRF

After much discussion with many stakeholders, I believe that the PBRF is an equitable policy mechanism considered in terms of the specific purpose of promoting research excellence. It would damage its effectiveness if it were required to have multiple functions of equal priority, such as utility, commercial value or cultural development. It is, for example, undesirable that the PBRF focus on excellence becomes confused with policy on innovation *per se*. In this context, it would be of value if government clarified its intentions more precisely with regard to the role of the PBRF, which is not uniformly understood within the research base or between TEOs and CRIs, and thus set out the desirable complementarity that it anticipates with regard to other, more targeted research funding mechanisms.

The balance between contending priorities, with regard to modes of research, fields, the status of researchers and so on, is not easily captured in rules and algorithms. The Guidelines that have evolved for the PBRF endeavour to provide a broad template for the fair operation of the assessment process, but to fit flexibly with changing research priorities and needs – by sub-field and with time – there must be some latitude for interpretation. The risk is that interpretation may introduce unintended inequities on the process by privileging some research over another.

Equity - the reasonable weighing up of evidence regarding established and new research, older and younger researchers, and different kinds of output – is best delivered by the peer review panels. Each panel has a subject portfolio, so subject differences should be absorbed by the established structure. Each panel has a range of experienced and professional members who understand the breadth and diversity of the subject area, and can contextualise research time frames, research and development, academic and policy impact, and professions and practice. If inequities arise then the first question has to be about rectifying 'business as usual' at panel level. Creating additional factors to offset perceived inequities should be a last resort.

Inequities are, on the whole, more likely to be reported by those who believe they have been disadvantaged than those who gain. There are diverse complaints about low grades but fewer about those who 'surprisingly' received an A. Academics being who they are, however, a wider range of reflective views exists than might be found in other surveys and I am grateful to many interviewees for their self-effacing honesty.

Some interviewees indicated that they felt inequitable outcomes were an issue. In discussion, however, they agreed that the PBRF operated equitably but they argued for a policy rebalancing. The perception of 'inequity' may therefore arise not from process but from residual dissent about purpose. That perception is that 'inequity' arises from the 'academic science' assessment model on which the PBRF is based. Policy makers would, presumably, argue that this model has proved successful in driving the knowledge business in many fields for a long time. There is therefore nothing wrong from a policy viewpoint with privileging a particular outcome if this is what is intended.

How are the other outcomes rewarded if also beneficial? In a pluralistic funding system, the PBRF role must be complementary to other sources. If it duplicates, then it is redundant. For example, highly innovative research proposed by less-proven actors might be best tested through competitive, grant-based sources such as the Marsden fund or FRST. Applied research outcomes may be best interpreted by specific research users, rewarding commercialisation by sales of products and Intellectual Property (IP). And so on.

It is logical that the policy intention should be to privilege a complementary role – a track-record of academic excellence – rather than to accommodate all activity. If the PBRF was intended by policy to address all outcomes equitably, then it would probably be being asked to do too much. The outcome would be compromised and deeper objectives would not be achieved.

A separate area of significant concern is in the domain of Māori and Pasifika research, and particularly in the work of the wānanga. The cause here is obvious: the model of knowledge and research differs from that used to construct the PBRF. This goes somewhat beyond the opening point about the role of the panel. It is about how inclusive the national assessment system should be. The PBRF Guidelines (TEC, 2005) are based on a model that, however broad its definitions were intended to be, may by being developed from a specific perspective exclude some areas of Pacific research and research core to the Māori Knowledge and Development panel. That panel, and the associated community, may therefore need to develop a set of comparable guidelines appropriate to purpose and of equal transparency.

A more satisfactory outcome will emerge if the PBRF is explicitly focused on 'excellence' and other policy tools are identified to address research users, institutional missions and the emergence of a strong Māori knowledge, research and development culture.

4.1 Effect on institutions

The major PBRF beneficiaries are universities, so the greatest concerns about the equity of the system are found among institutions that have been relative losers. Even among the universities, however, there was some feeling about missions and portfolios – to underpin industry, for example – that were less readily presented in terms of research excellence.

“We are at the more strategic end, which means we have a lot of ERI but not so much delivery in journal publications.” *Research manager, University*

Some researchers outside the universities were concerned that panels were dominated by staff drawn from a narrow part of the tertiary sector and were frank in their views!

“There are too many North Islanders, they're university dominated and they're internecine.” *Focus group, non-university institution*

The non-university institutions recognise that the PBRF is unlikely to provide a significant income flow and may in fact cost more to enter than can be harvested. For example, Otago Polytechnic described a shift from about \$1M under RTUs to about \$600k under PBRF. This is close to the institutional cost of responding to comprehensive assessment.

The PBRF is loaded with prestige issues because of the link between research activity and degree-level teaching. As a consequence, after lobbying in 2003 for a separate ITP fund and staying out of the PBRF, in 2006 a wide range of institutions decided they had to be in the exercise, with feelings of both anticipation and uncertainty.

“It was never envisaged that the ITPs would succeed. We did and this revealed a wider spread of excellence than anticipated.” *Senior staff group, ITP*

“Some knew the rules before it started, others are trying to work out how to play.” *Research director, ITP sector*

There is an evident sense that the 'playing field' is tilted. The ITPs do not generally expect to mount a major research strategy but they do expect to invest in knowledge development in appropriate support of their mission. They are required, morally if not explicitly, to participate in the PBRF but the ball is the wrong shape and the universities have more players.

New Zealand benefits from differentiation among its TEOs. The Tertiary Education Strategy (MoE, 2007: Distinctive Contributions, pages 14 – 15) says that the role of ITPs is to provide skills for employment and productivity, support progression to higher levels of learning or work through foundation education and act as a regional facilitator. The ITP mission is therefore about degree-level teaching which is underpinned by applied and technological research and addresses regional and community needs. This influences both the nature of their research and the forms of output generated.

Some in the ITPs now see the PBRF as a potential transformational driver, however, affecting current reputation and future finance. Such a transformation is seen by others as inappropriate.

“The PBRF is undermining our mission without offering an alternative position that would be equally well rewarded.” *Focus group, ITP sector*

“There is a tendency to employ new staff with higher qualifications but the opportunity [for research] is limited because of the teaching. This is becoming wasteful.” *Senior manager, ITP*

“We don’t need another 20 universities. We do need parity of esteem and a distinctive role for polytechnics and colleges of education.” *Focus group, Trades union (a)*

“It would be better to look for an alternative value mechanism to assess ITP activity, not try and twist the PBRF to fit.” *Focus group, Trades union (b)*

It should be understood that the argument is not that ITP staff find the PBRF process unreasonable. There are some individuals who have a prominent practitioner role, which could elide into an academic research role in another environment. Sometimes, the low density of assessment means that the association between individuals and grades is easier to track and can sometimes become invidious.

“There are no PGRs so there are no RDCs. The work would meet the quality criteria but is of low quantity so has less apparency.” *Senior researcher, Social sciences ITP*

“It wasn’t that challenging to get a ‘C’ mark.” *Head of department, Social sciences ITP*

The institutional outcome does not clearly justify the effort on the part of those staff and the concomitant effort on the part of the panel assessors. Most TEO calculations seemed to suggest that financial benefits outweighed costs but there are cross-currents from the TEC about this, proposing a reductionist approach to an institution’s financial situation.

[The TEC asked us] “why we’re doing research and why we’re putting \$1M per year into this area.” *Management team, ITP*

Formative benefits and future capacity development need to be significant to justify the effort expended. But, if growth in ITP research capacity is likely to be that significant, does this match the TEC policy intention?

Why is there a problem for the ITPs? It appears to lie with the existence of two separate requirements regarding research and its place in the teaching of degrees. The first is the Education Act 1989 which states that “degrees are taught mainly by people engaged in research” and the second is the method of acquiring funding to perform that research (the PBRF).

The Act and the PBRF should be consonant but in practice the level of research that meets the criteria of the Act is not directly related to the lowest peer-reviewed PBRF grade that attracts funding. This appears to be so because degrees taught in non-PBRF participating institutions still meet the standards required by NZQA for accreditation and subsequent audits. So, some institutions are meeting the research requirement for teaching degrees but are unable to access funding to perform that research.

To address this feeling of inequity there should be changes in the composition of the panels which would go some way to addressing this issue. There is also a view that the PBRF does not encompass, or perhaps recognise, all of the research that is performed in the ITP sector. If the NZQA definition of research for ITP degree providers is essentially the same as the PBRF definition (and ITPNZ believes that this is the case) then the PBRF should fully measure the research that ITPs do.

My initial reaction was also to recommend that New Zealand should find a different route to supporting an appropriate R&D capacity in ITPs and TEOs that values the relevance of this activity in terms of their distinctive mission. They could, for example, be advised of a presumptive allocation for this purpose, as part of investment planning, and invited then to develop a strategy to make best use of these resources within their overall Investment Plans. Allocations would be released via merit review against these prospective Plans, not against peer review of historical outcomes.

Commentators suggest that the PBRF is now beyond the point where the TEC could reasonably set up an alternative system for the ITP sector. There are staff that wish to be included in the PBRF and would suffer if excluded, the number of research collaborations between staff in ITPs and universities has increased dramatically and some ITPs have invested substantially in systems to enable participation.

It seems inconsistent to allow an organisation to offer a degree, set a standard for research activity and require the organisation to meet that standard but then not provide funding because the lowest level of research that is fundable is above the level of the standard. The problem is therefore how to operate a system where all degree granting organisations feel that they are included fairly in the PBRF. One option is to provide a universal baseline of research funds, but this would work against PBRF principles. Another is to establish formal equivalence between the requirement of the Education Act for 'engagement' in research and the minimal PBRF score (effectively, a new "D" grade with baseline funding) and fund down to that level.

If the effect on the ITPs is problematic, then this is even more evident amongst the PTEs. There is a divergent range of responses. Some welcome and embrace the PBRF and a research mission, some acknowledge it but are wary about their existing niche, others are disturbed, and some are rejectionist.

"A pressure is imposed to justify our existence."

"It has introduced good practice and heightened awareness."

"There is no positive effect for us but we have to be in for credibility." *Focus group, PTEs*

An evident problem for PTEs and Bible colleges is that research capacity is extremely sparse. The PBRF is expensive, provides little useful feedback, and reaches only a few. By contrast, the Focus Group reported much more positive reactions to the work of the NZQA. The NZQA evaluation process and the willingness of staff to explore and discuss research content and background for courses was seen as a productive and formative experience attuned to the TEO environment.

For the PTEs, the PBRF can be a significant burden and the objectives seem only loosely linked to their missions. It was suggested that, for the PTEs, it might be of greater local value and only marginal central cost if the TEC used discussion around the Investment Plans as a forum in which to explore, evaluate and support the 'applied research' component of their activity. This made immense good sense to me. The time spent on the PBRF returns could be much better directed towards an interaction akin to that offered by NZQA where evidence could be contextualised and feedback could be understood. This would reduce costs and enhance benefits both for the TEOs, which would increase their understanding and response, and the TEC, which would have a more effective and appropriately focused research base.

4.2 Effect on subjects

Academic natural science is the area from which PBRF assessment has sprung.

“... the model works well for science. Putting in your EP looks like ‘business as usual’.” *Research Director, ITP*

Social science and humanities have traditionally different research cultures which are frequently asserted to be less in tune with the indicators against which quantitative assessment often gears.

“It takes time [to complete an EP]. It’s not the way I normally do things.”
Professor, Creative arts

“The Guidelines distinguish areas of creative practice that are more research orientated.” *Focus group, Creative arts*

“Research that engages social issues is being down-graded.” *Focus group, Trades union*

The panels need to take responsibility for championing an appropriate assessment methodology within their subject area. On the whole, most interviewees felt that they did this. They are unhappy about some aspects of the assessment model and process but they do not feel that this results in their subject as a whole being under-assessed compared to other subjects.

A problem which has to be addressed is the ‘cult of relevance’ I noted in some areas of the New Zealand research base. This tends to assert a primacy both for applied research and for the readily assessable science model. It is now an historical issue in Europe, where the key role of creative arts and design, for example, has become widely recognised. Equality of esteem is mandatory if there is to be equality of assessment.

“There is continuing disciplinary bigotry. People ask ‘Arts and humanity spending – where does that get us? What problems does that solve?’” *Head of department, Science*

Diversity within panel subject areas causes more vocal concerns than differences between them. There is differentiation in research culture and mode within many areas. Sometimes it is problematic, but not always.

“Some areas – like surgery – tend to have more clinicians and fewer academics so they inevitably get a lower AQS.” *Focus group, Clinical/health*

“People claim it doesn’t recognise ‘their type of research’ but we range across all sorts and have as many “A”s and “B”s in the different areas.” *Head of school, Science*

[The PBRF] “is equitable in treatment of the different parts of Psychology.”
Professor, Social sciences

“It is harder for the applied scientists to get representation on the [PBRF] Panels, which over-represent pure science. Furthermore, the Panels made their own decisions over handling what was pure and applied.” *Senior researcher, Science*

“Geography is heavily fractal and it’s disadvantaged in its panel.” *Senior researcher*

“Geography and environment goes across from hard to social science. This introduces an uncertainty about who assessed an EP and whether there is parity of outcome.” *Professor, Science*

“[In art and design] there is a hierarchy from painting to printing to photography. A lot of our staff are in the ‘lesser’ genres, new to research and suffer in evaluation.” *Head of department, Creative arts*

“The PBRF disadvantages people working in the more practitioner-orientated end of subjects, dealing with the management of ICT for instance. The result is also affected by panel membership.” *Deputy principal, ITP*

“There is a perception that it is harder to get a high QS in the more applied sciences because of journal factors, eg. Economics vs. Agricultural Economics.” *Head of department, Social sciences*

The time span of work is also a factor. Laboratory-based experimentation can lead from hypothesis, then to test and so to outcome in a shorter time than field or survey-based work that depends on some longer cycle-time.

“In the panel’s area there were huge discipline differences in journal availability, work cycles, writing and citing behaviour. [X] and [Y] can publish quickly and have strong quantitative elements. This gives a perception of action which cannot be so easily evidenced elsewhere.” *Panel member*

“Applied, field-based science does not come well out of the PBRF. You can only carry out some work against the annual cycle, even when the lab work can be faster. Time taken to do two full cycles means that publication rates are low.” *Head of research group, Science*

Another effect is through the predominant mode of research. Subjects associated with applied research and professional practice may be less likely to produce readily assessable outputs.

“There’s a move out of [output modes] with industrial readership and into more academic journals with less industrial access. [The panel doesn’t value this] because the proceedings are disciplinary whereas the journals are unequivocal.” *Professor, Engineering*

This is discussed in the next subsections.

4.3 Research goals and modes

The review posed a set of questions to interviewees about the effects of the PBRF on the types of research which are now being pursued.

- Do you identify any actual, or emerging, negative effects that the PBRF is having on the type of research goals being pursued or on other aspects of the tertiary education system?
- Do you recognise some research, or types of research, as being inherently more risky than others? If so, do you perceive that the PBRF has had any effect on ‘risky and innovative research’? (This concern relates specifically to Tertiary Education Strategy priority 4 “Improving research connections and linkages to create economic opportunities”).

4.3.1 A preferred model

I noted above that there are concerns about the model of research that the PBRF promotes. There is a worry in some quarters that the assessment process tends to obscure a more informed view of what research should be seeking to produce.

“... a clear shift for research to be a primary activity, but a pressure-cooker attempt to make more activity fit the research model.” *Focus group, Creative arts*

“Creating things for PBRF points does not add up to real merit.” *Professor, Science*

“... we need to encourage reflective scholarship. There is developing interest and enthusiasm but [people] get into ‘stamp collecting’.” *Senior research manager, ITP*

“There is nothing wrong with publication since it does the writer good to go through the process of organisation but no one should be driven to publish because of a process.” *Professor, Humanities*

This is a reasonable concern. It is always a risk that the driver becomes the assessment instead of the process it seeks to assess. The issue here may be that the individual as the unit of assessment leads to a simplistic reductionism that foregrounds personal achievement (‘points’, ‘stamp collecting’) over the integrated achievement of a research group. I have referred to this point earlier and will return to it in later discussion (Section 5.6 : The individual as the unit of assessment).

Research is a long game, sometimes over decades between initial ideas and their delivery into products and processes. Short-termism is therefore another policy concern, and found in research-based industry as much as the public sector. It affects all fields and is most evident where success depends on long-term investment. I referred above to fields where annual cycles constrain data collection, analysis and outcomes. Longitudinal studies on population and environment – both natural and human – benefit from data collection over not two or three years but decades, yet the outcomes can be more informative than any set of short-term studies could hope to be.

“Longitudinal research is getting less attention. You can get regular publications of course but the real value is in maintaining the data-set.” *Professor, Social sciences*

It is a question of balance and it is a question that the peer review panels should be able to answer as part of their normal business.

The data on research outputs submitted to the PBRF reflect the choices that researchers make when they seek to evidence their research quality to a peer review panel. Using data in the report on PBRF 2006 we can see that a comparison between the category spread for the four NROs and the rest of the output lists shows that researchers selectively submit conventional academic research publications.

Table 4. The relative frequency of stated output types among Nominated Research Outputs and among the lists of other research outputs provided by researchers submitting to PBRF2006, data excerpts from the TEC report on the 2006 assessment (TEC, 2007: tables 3.3 and 3.4)

Output type	Nominated research outputs	Other research outputs
Journal articles	58% (10,295)	30% (21,913)
Books and chapters	12%	7.5%
Conference – published proceedings	6.1%	9.9%
Report for external body	1.8% (318)	3.7% (2,705)
Total outputs	17,908	72,378

Journal articles as NROs are about half the total of other research outputs whereas reports for external bodies represent less than one-tenth. This suggests that such outputs, which may have relatively high social or policy impact, and items such as conference proceedings that may be a more direct communication with research users, are seen by the authors themselves as having lesser weight in assessment and are disproportionately under-represented amongst NROs.

It may be that journal articles are a better indicator of an individual's best research but there should be no presumption that this is the case. Anyone familiar with evidence-based policy making will be aware that well-researched reports can have a profound impact. Gibbons et al (1994), in their discussions of 'Mode 2' research argued convincingly that outputs that connect directly with actors (with users and interpreters) are an increasingly frequent and potentially more important mode of disseminating knowledge. Panels need to make clear, in the PBRF guidelines, the weight they will attach to different forms of output. The responsibility lies with the panel to contextualise quality whatever the output mode.

4.3.2 Risky and innovative research

It should be a *sine qua non* of excellent research that it is both risky and innovative. How can it be otherwise at the cutting edge of internationally competitive activity? If it is genuinely original then it is innovative, and the best researchers follow intuition rather than certainties.

I am therefore uneasy with the identification of any main field as being innately more risky and innovative than another. Within a major field there may from time to time be foci that are more risky, perhaps because they are changing rapidly, but this does not distinguish one discipline from another. The panels will be aware of where these foci are.

The TEC has produced a detailed and informative report that compares the PBRF outcomes for different fields, to evaluate the relative performance of those fields deemed by government to be 'risky and innovative' (Çınlar and Dowse, 2008a). The results do not suggest that earlier concerns about the PBRF's effect were justified. Having read the report, I find it difficult to conceive that any more could usefully be done to the available data that might produce a conclusive result.

The evidence I gathered suggests that the effect of the PBRF on risk-taking is probably the same as any performance-appraisal system. Those that are confident in their work will continue to pursue exciting goals while, as noted by AAAS (2008), the less confident will become more conservative.

[The PBRF] “enables more risky research to be conducted on the periphery, because of the additional funds which gives room for manoeuvre.” *Head of department, Clinical/health*

The consequence of this is that there will be some move towards research that is more predictable, both in general outcome and in the likelihood of producing outputs that are perceived to fit easily with PBRF assessment. However, this effect is least likely to affect those who are working in the most competitive, cutting-edge areas and these latter researchers are more likely to see benefits from resources made available in the institution through the PBRF.

4.3.3 Collaboration and attribution

The PBRF should stimulate researchers to look for innovative and challenging opportunities that will have an impact on their field. Such opportunities are more likely to be faced effectively if they are tackled in consort, bringing many minds and resources to bear. A growing proportion of the world’s leading research, nationally and internationally, is collaborative and it is important that research policy and assessment in New Zealand supports rather than obstructs moves in this direction.

Many researchers felt that the PBRF was encouraging joint research where previously there would have been resistance.

“The PBRF has driven collaboration further and faster than would otherwise have happened.” *Focus group, Social sciences*

“... a sharp increase in collaboration. People are asked to account for their contribution ... but it’s the quantity of output and the likelihood of citations.” *Head of department, Social sciences*

“There is no evidence that the PBRF works against collaboration.” “It’s pro-collaboration because performance is scrutinised.” *Focus group, Clinical/health*

But the effect is not uniform. There is some concern that the design of the PBRF may become detrimental to collaborative research by over-emphasising the need for fractional attribution of credit to individuals and to their institutions.

“Attributing research ownership is a public, early discussion in any collaboration.” *Professor, Science*

Collaboration is seen as a cost, because of authorship, so you rewrite to acquire individual authorship. But the funding agencies like research teams. So how do you go?” *Focus group, Social science*

“The PBRF doesn’t encourage partnerships because it partitions credit and income. Cross-institutional partnerships are discouraged.” *Focus group, PTEs*

The PBRF format requires researchers to explain what their contribution was to each multi-authored NRO. On the one hand, it is not unreasonable to expect some brief comment to this effect. For example, clinical research journals have been leading the way in asking authors to provide a common statement about the balance of input to each stage of the reported work. On the other hand, an undue focus on this fractionation of credit can lead to a perception that ‘sharing’ intellectual outcomes means a loss of esteem and credit. In other words, a belief can arise that single-author publications are more valuable.

As with other aspects of the process, the greatest negative effect seemed to fall on the least experienced researchers. Well-established leaders seek collaboration and have little problem with shared attribution. The neophytes are much less confident and may even see the attribution requirement as a detriment. The solution is probably through improved awareness and personal development.

4.3.4 Practice-based and professional development

There is undoubtedly an issue about both individuals who are strongly practice-based and about research activity that is focused on practitioners.

“Is your community of practice international or is your target necessarily more local?” *Focus group, Social science*

Some (but not all) people feel that the outcome of assessment tends to devalue practice-based activity.

“There is a problem about meeting the language of the process. Professional practice is not fully acknowledged.” *Subject leader, Creative arts*

This suggests that there may, in some instances, be differing views on what constitutes research excellence despite the breadth of the definitions. Should the PBRF recognise excellence in practice-based research if it does not also deliver excellence in the academic domain? Some practitioners believe that the panels distinguish between the two and that practice cannot be PBRF-excellent unless accompanied by academic evidence. On the other hand, it might be argued that the best current practice is likely to be closely associated with an excellent academic base. In the short term, however, a dilemma is posed for some about where their efforts should be invested.

[We have] “a commitment to practise-relevance so every year’s publications have a large proportion of theory but at least 25% of contribution to practice. But the ‘quality’ ranking of the latter is lower.” *Director of school, Social science*

“It also affects my teaching, which has become more research-orientated and less career [development] orientated.” *Professor, Engineering*

“Is it better only to put forward that part of the community who fit the model of international practice that this research paradigm is fitted to?” *Focus group, Social science*

“We challenge the use of journal impact factors, which are misdirecting people to publish in the wrong output channels for practitioner impact.” *Head of department, Clinical/health*

“The development of good practice is longer-term, not post-doc [research assistant] driven.” *Deputy principal, ITP*

Two discipline areas where these issues arose in every interview were Clinical medicine and Creative arts and design.

“Plenty of top clinicians will only be 2/10 appointment so they will have much less time for academic activity. But the PBRF does distinguish between big service-earners and real research quality.” *Professor, Clinical/health*

“... the best Jazz musician in the country doesn’t get above ‘C’.” *Head of department, Creative arts*

“The [staff awarded] As are unknown outside here. The well-known architects are unrated but they’re up to date in professional practice and they’re able to deliver to students.” *Focus group, Creative arts*

Many TEO staff have a foothold in two camps: the academic discipline within their institution and a professional discipline outside it. Their community, or network, crosses this boundary and their status and career development depends upon playing an effective role in both aspects. Only if they achieve professionally can they also deliver effective knowledge outcomes academically, in their teaching as much as in their research.

The question therefore arises as to whether the PBRF gives sufficient and appropriate credit for the innovative research component of professional activity as well as academic activity. Some feel that professionals are better avoiding the process than being mis-labelled.

“There are conflicted outcomes. New Zealand needs to develop all its professional groups whatever their impact, but the PBRF focuses on only one kind.” *Focus group, Social science*

“You need a voluntary opt-out for those who focus on professional practice, who are presently ostracised by being entered and then rated as research-inactive.”
Focus group, Creative arts

The problem is that much professional activity does not readily qualify as ‘original research’, but the boundary between strict professional practice and professional innovation (essentially, a form of translational research) is inevitably blurred. Individuals are engaged in activity and producing outputs on both sides, or actually crossing, these boundaries and the high impact output is not academic.

“People who write for ‘trade journals’ are often ‘new and emerging’ but it’s a good way to start your career development.” *Professor, Engineering*

“You’ve got dry, scholarly articles and glossy, well read and well used magazines.” *Professor, Creative arts*

This is not an easy question to address. It is perhaps one that could be taken further by the TEC, through the work of the SRG, but my perception is that a solution can only be found in the work of the appropriate panels. It is for them to evaluate the professional component of staff activity, to consider the evidence offered and then to determine the innovative impact of this on the wider field.

While it might be valuable if panels could include additional members from outside academia, who would make them more effective by helping to produce and validate the assessment, it is far from simple to recruit appropriate people and it might equally be argued that their input overstretches the PBRF remit.

4.3.5 Working with users

I noted earlier that criteria for excellence should not be compromised by criteria for utility, but is excellence at the interface with research users given appropriate credit? Many felt it was not. This was not a universal comment from those in applied areas, however, and many said that not only was good applied research inevitably associated with good basic research but also that there was synergy in the feedback.

“Commercialisation has no adverse effect on those at the forefront. The ones closer to big-Pharma are all “A”s. They’re the people with excellent basic research, have big groups, do great application.” *Head of school, Science*

“The incentives are for international publication. [Our department] has taken work right the way through to commercialisation but the PBRF gives no reward or recognition for this.” *Head of department, Science*

“High quality applied research was a strategic objective prior to 2006 but staff challenged this if ‘it didn’t fit the PBRF’.” *Senior staff group, ITP*

Another view was that commercialisation was an end in itself. If research was worth exploiting then the outcome provided both kudos and financial outcomes, which took the research outside the PBRF domain. If there was no financial reward then commercialisation was futile.

More generally, there was a question about whether credit for 'applied research', a debatable term in itself, was either sufficient or necessary. Some saw the PBRF sending a signal about the greater priority of fundamental knowledge creation.

"There are messages about engagement. Applied work that speaks to policy priorities is not enough." *Research leader, Science*

My perception is that the PBRF redresses a tension within the New Zealand research environment, to which I referred earlier, where an over-emphasis on short-term targets has drawn research away from international concepts of research excellence. This is in no way to dismiss the importance of research that addresses national priorities, but it must always be excellent research. The PBRF reasserts that desirable, extra-national agenda. This is seen by researchers to be valuable because utilitarian, applied research risks a focus on the narrow field and the near horizon.

"You work with one company, you solve its problem today. You work with seven companies, you solve an industry's problem tomorrow." *Head of department, Social sciences*

This left another tension between government objectives in the area of commercially directed research, a problem familiar to many research assessment programmes.

"PBRF promotes early publication; government promotes retention of your IP." *Deputy Vice-Chancellor*

Applied research, development and exploitation require panels to act sensibly when presented with appropriate evidence. Such evidence may be confidential and panels will then have to make a judgement on research quality without the reassurance of publication benchmarks. On balance, they should be able to recognise the difference in quality and kind between applied research that has local and international impacts, just as they judge pure research across that scale.

4.3.6 Regional research

There were a significant number of references by interviewees to concepts of 'international' research as a benchmark against which their work might be judged. The concept of internationality is an interesting one, and is balanced by the identification of a desirable and characteristic New Zealand flavour to its research.

This is an issue which affects Māori and Pacific studies generally, although that is being positively addressed by the research community (Section 4.5 : Māori and Pacific).

Working on kiwi conservation does not necessarily make you parochial, any more than working on the reintroduction of birds of prey is parochial in the UK. Similarly, studies of particular ethnic or social communities is no more or less parochial in Manukau than Dusseldorf or Philadelphia. Contextualising the research outcomes is the critical problem.

The scientists were, on the whole, focused on the network of leading journals that provided the highest profile communication with their global communities. Many of these journals are published in Europe or North America which makes them non-New Zealand as well as 'international' because they are standard-setters. For biochemists, a molecule does not recognise national boundaries so research in New Zealand or the USA has a 'common interest'. Social scientists had a more obvious problem: many social research problems are strongly parochial. However, key figures felt that this was something that could be overcome in a balanced way. It is, to some extent, a matter of how people frame their knowledge.

“Why did I get an A? Publications in international journals that connect New Zealand with the world. You use New Zealand outcomes to challenge concepts asserted in work by the leaders in Europe and the USA.” *Research director, Social sciences*

“Interaction with the international community does not mean that you have to make everything publishable in US and UK journals.” *Senior researcher, Social sciences*

European research assessment involves constant cross-national references. It is easier to build confidence in judging whether research located in one jurisdiction would be accepted as having an international standing. This is very much more of a challenge in New Zealand, where international interactions are attenuated.

“The regional development of our discipline is being compromised. It would be a shame if the only journals that count are US and European.” *Panel member*

It is important that the community should develop greater confidence that the best national standards equate to international standards. The alternative is that the regional flavour will become diluted and lost in a wholly undesirable trans-Atlantic mix.

4.4 Effect on people

Because the PBRF uses the individual as the unit of assessment there is a need to reflect carefully on individual level effects.

There is some concern about groups of staff who are not assessed, and there is some concern about staff who are assessed but probably should not be. I will return to the issue of the ‘target population’ in later discussion. (Section 5.4 : Who should be assessed?)

The biggest problem in individual assessment is that panels will inevitably find it easier to judge the quality of those with well-established reputations and a packed EP.

“Grades went with hierarchy rather than competence. And some good [European] recruits scored rather less well than expected.” *Head of department, Social sciences*

Concern focuses again on new researchers, the way they are managed and assessed and the effect this has on their status and careers. The effect of the PBRF on human resources has been analysed in a TEC working paper which I discussed earlier in the context of people management. There is some evidence that younger staff are being excluded by institutions.

“At TEOs participating in both the 2003 and 2006 PBRF census, the pool of staff under the age of 35 shrank by 14%.” *Çinlar and Dowse (2008b)*

This effect is a consequence of individual assessment and should be a concern for the long-term welfare of research quality. It became clear after PBRF2003 that the system had encountered a challenge in assessing the performance of rising researchers: the talented but young or, more correctly, new. Many of the researchers in this group are indeed young, having recently completed or still completing their doctoral theses. There is a growing cohort of older entrants as well, especially in disciplines with a strong link to professional and practitioner areas where experiential competency is highly valued. Thus the term ‘new and emerging’ (NE) researcher was coined to identify this composite group.

For PBRF 2006, the criteria required to achieve a “C” grade were modified to enable the entry of more NE researchers to this grade, where their track record was inevitably less but their evidenced promise was above average. Unfortunately, in many meetings I was told that the NE labelling remained problematic and that the assignment of a “C” grade was seen by rising stars to undermine morale and to stigmatise their position.

“Since school, I had never been marked below average for anything [until 2006].”
Junior researcher, Science

Many interviewees referred to the impact that a “C” or even an “R” grade had on new research staff. Whatever the caveats applied to the reporting, the impact on the individual of being told they are only at R level is immense, and even a C grade is challenging to accept if it is then a label to be carried for the next six years. The NE label does not fully solve this problem.

I have already raised the question of staff profiles and the desirable career-development pipeline of growing experience and competency. I believe that there is a series of issues arising for NE researchers as a consequence of individual assessment. I do not agree that the outcome is inequitable, because the PBRF assessment process is doing its job. But the outcome is unfortunate and inappropriate because this labelling of the NE staff is unnecessary. My conclusion is that the modification of criteria has not been a sufficiently satisfactory answer, and while it may have addressed one problem it has perhaps drawn out another. My tentative feeling is that either the ‘NE’ labels or the individual assessment focus should be removed, but I am unclear whether this leaves a sensible outcome.

4.5 Māori and Pacific

There are three levels of consideration. Were there any effects relevant to Māori and Pacific researchers? Were there differential effects on Māori knowledge and development, captured particularly but not exclusively in the specific subject panel? Were there specific effects relevant to the wānanga?

4.5.1 Researchers

None of the staff that I spoke to raised any issues of concern at the level of individual researchers.

The TEC has published an analytical report By White and Grice (2008) on “Participation and Performance by Māori and Pacific Peoples Researchers”. The report is available at (<http://www.tec.govt.nz/templates/standard.aspx?id=2547>) and considers the treatment of different groups of staff across panels. This analysis raises no issues of concern.

The overall profile of Māori researchers differs from that of Pākehā but remained stable between quality evaluations. Of eligible Māori researchers, the proportion for whom EPs were submitted was greater in 2006 than 2003 but remained slightly lower than for PBRF researchers overall. Between 2003 and 2006, there appeared to be a shift of Māori researchers into older age bands and a growth in the already greater proportion of female Māori researchers.

Some of the differences are accounted for by the distribution across subject areas, and this also then has a subsequent influence on the balance of scores. Interviewees suggested that not all Māori researchers would necessarily declare this and the likelihood of their doing so might be subject-dependent.

“If you’re a physicist, you’re a physicist, not a Māori physicist. In social science it’s probably different.” *Senior researcher, Science*

White and Grice (2008) note that this creates a problem with their data which depends on PBRF-eligible researchers’ self-reported ethnicity. A limitation is the large numbers of participating staff for whom no ethnicity information is available.

The researchers of declared ethnicity are clustered in a small number of panels. Māori researchers’ EPs were largely assessed by the Education Panel and the Māori Knowledge and Development (MKD) Panels. Other panels that assessed significant bodies of Māori EPs included the Creative and Performing Arts Panel, the Social Sciences and Other

Cultural/Social Sciences Panel, and the Medicine and Public Health Panel (in 2006). A consequence of this is that known Māori researchers' EPs attracted lower subject weightings than did the average PBRF researchers' EPs because those subject areas had lower overall ratings.

“It is possible that Māori or Pacific peoples' researchers in New Zealand might disproportionately work in areas of national importance and priority, yet find their research receives lower quality scores because of, perhaps, the cultural characteristics of their research”. *White and Grice (2008)*

However, there were compounding factors. Māori researchers' EPs contained comparatively smaller numbers of NROs in both quality evaluations. Māori researchers, particularly researchers in wānanga, submitted considerably smaller proportions of some 'esteemed' outputs such as journal articles and books, than did all PBRF researchers.

In 2003 and 2006, the profile of quality scores achieved by Māori researchers was lower than those achieved by PBRF researchers generally. In 2006, a greater number of Māori researchers achieved quality scores less than 200 compared to 2003 and this shift is reflected in lower mean scores overall. This shift may, however, reflect high numbers of submissions by Māori NE researchers in 2006 which would be in line with the increase in the proportion of all researchers achieving a quality score under 200.

Whereas there was an overall increase in the proportion of researchers in A and B categories between 2003 and 2006, the proportions of “A” and “B” categories among Māori researchers were stable. However, both the number and proportion of Māori researchers who achieved a “C” funding outcome increased noticeably from 2003. In 2006, over a quarter of the “C”s achieved were “C(NE)”s, and the proportional increase in “C”s among Māori researchers from 2003 to 2006 is higher than the increase for all PBRF researchers. This compares with a proportional decrease in unfunded Rs. Thus, the introduction of the NE category may have allowed more Māori researchers to achieve a “C” result, reflecting the relatively greater numbers who were new to research.

For Pacific peoples' researchers, the mean component scores were stable between 2003 and 2006, although they were comparatively lower than mean scores for all PBRF researchers. Pacific peoples' researchers were older, more frequently male, and more senior in career in 2006 than in 2003. The distribution of Pacific peoples' provisional quality scores appeared to shift between quality evaluations and in 2006 there were relatively more scores in higher ranges. The proportions of “R”s decreased from 68 percent to 50 percent and, at the same time, the number who achieved a funded “C” category increased markedly from 20 to 36 in 2006. Again, the NE category may have facilitated this change.

My judgment is that the available data do not give rise to concern about equity of treatment of different groups of researchers. Māori researchers do have lower average outcomes but many were in fields with lower average outcomes and they submitted a smaller proportion of NROs. The relative growth due to the NE category further supports the TEC view that Māori researchers are disproportionately 'new' to research and this will rapidly change. The data on Pacific researchers may support a similar view, but are too sparse for sound conclusions.

The outcomes do, however, suggest some unresolved cultural issues. There may be an imbalance of groups across different subject areas. This will hopefully be resolved as tertiary participation rates improve, an increasing number of Māori and Pacific researchers are seen to take senior positions in a wide range of fields. The wānanga will likely also have a critical role to play in widening pathways into tertiary education.

4.5.2 Subject and discipline

The bulk of information that I received relates to Māori Knowledge and Development (MKD). I received valuable inputs from individuals regarding Pacific research, but I am not in a

position to make conclusive remarks differentiating Pacific outcomes from Māori or other research outcomes.

Important issues arise at the disciplinary level but, as I noted earlier, I am reluctant to venture too far across what I see as a foggy landscape. What I fully accept is there are distinctive characteristics linked fundamentally to the knowledge culture associated with, respectively, 'western academic' and Māori approaches. The provisional status of knowledge and the significance of the falsifiable hypothesis would be identified by many researchers as key characteristics of western knowledge concepts, and they are implicitly part of the PBRF assessment model. The rather different status of retained knowledge, knowledge development, knowledge ownership and knowledge transmission in Māori culture means that the meaning and status of research differs. The feasibility of assessing relative excellence is therefore also a challenge.

There is a conflict between 'conventional' international standards and Māori knowledge. It is difficult to resolve because there are rather few reference points at present, but the conflict is not unique. It also appears in research assessment in Canada and in South Africa. In both these jurisdictions there are significant emerging areas of research associated with the established knowledge and research methodology of indigenous groups. It seems likely that a new consensus about international reference points will emerge from this trans-national research community over the next few years.

An option would be to accept that there may be a medium-term gulf between western and indigenous research traditions and to fund Māori research through another mechanism, but the risk is that this stigmatises such research as not only different but weaker.

When I met with the Māori committee of the NZVCC, I asked if they could offer advice on this. Te Kahui Amokura kindly provided a written submission from which I can quote at length. While strongly supporting the retention of the MKD panel, Te Kahui Amokura agreed that greater clarity was needed about appropriate criteria. They note that most panels are built on stated subject areas and academic disciplines, but the MKD panel places importance on the methodology used and has an inter-disciplinary focus. The approach taken to research is afforded greater importance than the subject researched.

Te Kahui Amokura does not believe that this central criterion is sufficiently appreciated either by researchers or by TEOs. There is anecdotal evidence that sometimes MKD is regarded as synonymous with Māori Studies, whereas in practice they overlap in a complex mosaic. Researchers in Māori Studies use a wider range of methodologies than Kaupapa Māori research paradigms and their research might be equally well assessed by a relevant disciplinary panel. In contrast, researchers in disciplines such as law, health, environmental studies, may use Kaupapa Māori research methods and could elect to submit their portfolios to the MKD panel.

As I noted in regard to indigenous studies in other jurisdictions, the MKD panel is not able to draw on conventional markers of excellence, especially world class excellence, nor are there well established and widely recognised publications that can act as proxy indicators of excellence. Te Kahui Amokura judges that, in this respect the panel is still evolving.

Finally, Te Kahui Amokura notes that it is important that the MKD panel has a balance of members with expertise in Mātauranga Māori (Māori knowledge), Kaupapa Māori research, and research experience in a range of specific subject areas. For researchers, appropriate selection of panel members and early confirmation of the criteria that this panel will use will be important in preparing their EPs.

It seems likely that over the next few years there will be a significant development in knowledge concepts in and around Māori research as both 'studies' and MKD, spurred both by comparable global changes and by the growing assertiveness of the research community in New Zealand Aotearoa. I believe that it is of fundamental importance that the evolution of these changes should be owned and directed by the relevant research community. It is, by

contrast, equally undesirable that standards and processes should be imposed by simplistic transfer of models from other disciplines.

Because the PBRF process, and its successors, are the primary route to distributing research resources in TEOs, it is desirable that the Māori research community should engage with the process by establishing an appropriate and defensible quality reference system of its own. Te Kahui Amokura indicates that it is happy to assist in the ongoing development of MKD.

“Although in the past two rounds Māori academics have accessed a wide range of panels, and will continue to do so, the significance of MKD as an indigenous response to the PBRF process warrants continuing attention and greater consideration to the markers of quality.” *Te Kahui Amokura, 2008*

4.5.3 Wānanga

I was extremely grateful for the time given by staff at Te Wānanga o Aotearoa and Te Whare Wānanga o Awanuiārangi during my visits to their campuses.

I should be frank and say at the outset that I thoroughly enjoyed the time spent at the wānanga, where we had a series of fruitful discussions about the work that they were doing, about the research in which they were engaged and about the breadth and diversity of the activity they support. This constitutes a complex and interlinked portfolio, where research is arguably more evidently linked to teaching and learning than it is many universities. The R-T nexus is often asserted but it is in the wānanga – and perhaps the ITPs – where it is most easily seen to operate.

The research portfolios are diverse and I encountered some research activity that in a science, social science or arts context would – in my view – be immediately acknowledged as easily reaching national and often passing international standards. But by no means all the research activity is so easily assessed.

Te Kahui Amokura has made the point that methodology is as important as topic, and this aspect is something that can be interpreted on the ground for the non-expert but may be a challenge for a peer review panel. The preceding section indicates why it is problematic to try and fit MKD in its current stage of development to a different research paradigm.

The wānanga have the potential to make an essential contribution to the knowledge business, and to enable New Zealand to make the most effective use of all its talent. But the existing knowledge concepts in MKD, and therefore in the wānanga, are in transition. I feel that it is of rather little value to make the work of the wānanga fit the PBRF model, and it is a challenge to the PBRF model for it properly to evaluate what the wānanga are doing.

In conclusion, given the discussion on MKD overall, my recommendation would be that New Zealand should find a different route *pro tem* to supporting the knowledge mission in the wānanga. However, it is potentially disappointing for the excellent staff who are joining the wānanga from universities and ITPs not to be seen as directly comparable in research status to their peers. As new conceptions of knowledge and research emerge in the wānanga and from Te Kahui Amokura, the position should be kept under review with the intention of returning assessment to the mainstream at an early opportunity.

5 How can the PBRF be improved?

This section is both a review of the assessment process and a summary of areas for possible modification. The terms of reference asked the review to identify whether the current PBRF system could be improved, and in particular to examine:

- weightings for the three components of the PBRF: the QE, RDCs and ERI, including the subject-area cost weightings that apply to the QE and RDCs
- the individual as the unit of assessment
- the design and implementation of the processes and procedures for the 2006 Quality Evaluation, and whether and how these processes and procedures might be improved for the proposed 2012 Quality Evaluation.

I conclude, from my review of the available written evidence and secondary data analyses and from my extensive series of meetings with stakeholders and staff in TEOs, that the PBRF is working effectively and that there are clear and positive signs that it is having a beneficial policy effect on the New Zealand research base. This effect is strongest in the motivation of individuals throughout the system and the greater emphasis on research.

In thinking about improvement, which I judge to mean 'refinement' given current success, I have focused on individual evidence rather than the inevitably latent quantitative indicators. I have integrated researchers' comments on the process with my own analyses and my suggestions as to ways in which the PBRF might be modified. In doing this, I have reflected on what might be done for 2012 and what might be part of the PBRF trajectory after 2012.

5.1 Stability and change

The PBRF is relatively new and people are still adjusting to its implications. A majority of the researchers to whom I spoke consequently wish to avoid significant change at present. They are broadly content with the system that Tertiary Education Advisory Commission set out. They have started to become familiar with the rules and structures of the system as conceived in 2003 and would like to maintain their climb up the same learning curve towards 2012.

Setting aside the idea that we can create an ideal system, I think the general view makes pragmatic sense. New Zealand is likely to benefit from consolidation of the current PBRF model. The present system is fit for purpose and it is important for the TEC to maintain and build on the commitment of the research community. The possible short-run changes to which I shall draw attention are therefore limited in scope. I think some more substantive changes might be considered, but no benefit is certain.

Whether any proposed modifications are adopted or not, I suggest that complete and final guidance for PBRF 2012 be determined by late 2010 and not then changed. The TEC should appoint a PBRF Manager for the process as soon as possible and should not move them between posts until it is completed.

The PBRF Manager should be responsible for regular briefing of TEO research managers and of the TEC staff. The supporting software must be finalised by end-2010, should have undergone widespread testing across the system and should respond to the issues raised by the TEOs via this review. In particular, it should be efficient and user friendly.

Any changes for 2012, which might aim for simplification rather than complexity, should be developed before 2010 and then not changed. The ideal timetable would be review and development by the SRG in 2008, consultation in early 2009 and then decisions and confirmation of process early in 2010.

The guidelines should be circulated for consultation, to ensure that the various professional communities are given a further opportunity to comment on the specific guidelines applied to their discipline. There is some concern that these were not as informed as they might have been, which may be unjustified but is easily remedied.

More substantive changes may be desirable in due course, and I will describe these below. These could be reviewed, modelled and developed by the SRG, under Professor John Hattie, as part of a more comprehensive evolution post-2012. If this work were also completed by 2010 then the sector would be in a good position to prepare for course modification while still avoiding the shoals of the existing system.

5.2 Prior information

A criticism levelled by almost every TEO was that information from the TEC had not always been clear, that some information was changed and disseminated unduly close to the deadline, and that the software used to support the PBRF had been inadequate.

“Is the TEC a trustworthy institution? They make impossible demands on the TEOs and then they relax their own timetables.” *Focus group, PTEs*

The criticism was sharpened by the fact that communication between TEOs and the TEC was sometimes rapid, lucid, and helpful. It was therefore a frustration to institutions that these high standards were not always met.

[Staff name] “always knew what was going on and usually replied the same day. When he wasn’t there they had no idea and sometimes we never got an answer.” *Research management team, University*

Perhaps the most fundamental demand was for clarity and stability. There is a sense in the sector, raised by universities, ITPs and PTEs, that the TEC staff turnover is rather high and that TEC’s own intellectual capital, its knowledge of the PBRF operation, can be fragile as staff move between divisions so lessons learned in 2003 were not applied in 2006.

“During the 2006 PBRF round TEOs were not always receiving the same advice as other TEOs, but different staff within TEC were sometimes supplying contradictory advice to the same TEO.” *Research manager, University*

The PBRF 2006 Guidelines were not available until July 2005 but TEOs were then required to apply the new criteria to legacy data through 1 January 2006. The new criteria included finer classification of certain research outputs. For example, conference contributions were initially recorded under a single category but six new categories were now applied which required substantial manual re-working. Similarly, the ‘New and Emerging Researchers’ category, while welcomed, challenged HR record systems which did not allow electronic extraction of the information needed to determine eligibility. These late changes occurred at a time when TEO staff would inevitably be absorbed with finalising PBRF 2006.

The relationship between the TEC and TEOs has to be a compact of mutual dependency. The TEC or its equivalent will be around as long as government needs TEOs to train people. Some TEOs have been around for a century and most will last as long again. Fundamental processes like the PBRF really need to be developed jointly, with the TEC taking a clear lead but constantly involving the knowledgeable and thoughtful staff in the TEOs who will ensure that their institution implements the process and complies with TEC expectations.

One additional point for the TEC, affecting individual academics, was the treatment of the original copy of NROs. These are not simply documents or other media: they represent a significant and valued part of an individual’s work and should be given appropriate respect. Concern was expressed by several interviewees that the TEC had not understood their status and items were returned after an undue delay.

5.3 What should be assessed?

It has been noted, in New Zealand and elsewhere, that research activity indicators are frequently closely correlated. It would be worrying if they were not, but the fact that they do seem to say the same thing raises questions. Do we need so many different pieces of information? Does it matter which one we use? Could it not all be made much simpler and still get the same outcome?

[We are measured by] “shibboleths of the accountants.” *Professor, Humanities*

“If you want to badge the institution why evaluate all the individuals.” *Focus group, Science*

I agree that, on the whole, an assessment based on a random sample of staff, or one based solely on Professors, or one using some arbitrary indicator, would likely produce a similar overall result. But arbitrary metrics would totally fail to acquire the confidence of the community and would rightly be open to repeated challenge.

If multiple indicators are correlated that does not mean they are redundant. Peer review looks for consistency and responds with nuanced judgments where indicators do not add up. It looks in more detail where they diverge. Excellence is about getting the whole package right: income, training, staffing, outputs and outcomes.

The UK Treasury recently proposed that university research funds should be distributed via a simple formula geared on a single indicator (Research Council grant income). The proposal was widely ridiculed, not least because of the massive residual variance that a single indicator left, and the subsequent models have gradually restored more and more information and, most recently, have returned peer review to the equation.

Research is complex and no single indicator will do, not least because the process has to be credible to those who are being assessed and the diversity of input data and the overview taken by a peer panel is part of the platform that assigns that credibility.

I therefore believe that the use of both EPs, with PE and CRE components as well as publications, and RDC and ERI data strengthens the overall assessment.

5.4 Who should be assessed?

I believe that there is some confusion, and some wilful game-playing, around the definition of staff eligibility. It is likely to be beneficial for equity of assessment and outcome and for quality of information if a clearer definition can be developed. I suggest that the aim should be to move away from the general eligibility established by reference to the Education Act and to focus instead on a core group of permanent academic staff around whom the research system pivots.

How can this core group be defined? The ‘principal investigators’ (PIs) represent to me the staff responsible for producing the activity being assessed and steering the strategy for which the PBRF is allocated. These are leaders of research teams in science and key thinkers and writers in the humanities. These are the people who apply for and manage research income, who recruit and supervise the postgraduate researchers, who employ the postdoctoral research assistants (PDRAs), who write or oversee the writing of the books, reports and papers and who will guide what happens during the next cycle. They also determine the structure and delivery of all teaching in their academic units.

It seems to make good sense for assessment to focus on these guiding lights rather than a diffuse population in their penumbra. The more diffuse population adds volume but I think its activity adds very little additional information about research excellence.

At present, the PBRF gears against an assumed T-R dependency captured in the Education Act. It seems unlikely that those who framed the Act would have had the PBRF’s objectives

in mind. While the Act's expectations are well intentioned, their subsequent application to research assessment produces some uncertainty. First, many people with marginal or nascent research records are being unnecessarily and unproductively assessed, or being deemed eligible for assessment, found wanting and then marginalised. Second, institutions are quite clearly playing games with contractual definitions in order to alter the numbers being included.

"The guidelines are unclear." *Research manager, University*

"The design assumed honesty. Wilful misuse surprised people." *Deputy Vice-Chancellor*

Many respondents referred to junior researchers as a group that were on the margins of satisfactory assessment. The term most usually indicates PDRAs in the sciences, who rarely have an independent research portfolio but may be doing some support teaching as part of their career development. They seem likely to be at too early a stage for separate individual assessment to be meaningful but many institutions have felt that they are eligible for PBRF and must be submitted.

"There's not much of a case for including the post-docs." *Deputy Vice-Chancellor*

"Post-docs is where the gaming occurs. The philosophers did well on AQS: the discipline is dominated by lonely professors." *Professor, Science*

"Having post-docs is a mark of group quality but individual assessment for them is a real problem." *Focus group, Science*

While these respondents felt that junior researchers could safely be excluded, some institutions favoured a more inclusive submission because they saw the goal as maximisation of income through maximisation of volume.

Volume affects both income and Average Quality Score (AQS). The effect of this – on funding and on indexed quality – has not previously been calculated by the TEC in any analysis. I therefore carried out a test analysis of the impact on funding and on AQS of a notional group of postdoctoral researchers, shown in the following table.

Table 5. The effect of including junior researchers as eligible staff

In this scenario, two departments (A and B) each have sixteen academic staff (16Ac). B has better research performance, and hence a slightly better grade distribution, and it employs five postdoctoral researchers (5Pd).

Scenario	Staff	Grade				Outcome	
		A	B	C	R	Income	AQS
A	Dept A 16Ac	2	7	7		38	2.38
B1	Dept B 16Ac, omit Pd	5	6	5		48	3.00
B2	Dept B 16Ac + 5Pd	5	6	7	3	50	2.38

By including the postdoctoral researchers (who receive an assumed score of 2 "C(NE)" and 3 "R(NE)"), B gains slightly in income (50 instead of 48 units) but its AQS drops back to the level of A. The effect is reputationally significant and financially trivial.

The PBRF's inclusive assessment compromises the information content of the outcome. If the non-core researchers are included in the PBRF then it is no longer possible to distinguish B as a 'better' unit than A by score alone, although it has more "A" grade staff as well as the junior researchers.

Could my exclusive, core group of eligible staff be defined satisfactorily for PBRF purposes? I am uncertain and some informants tell me it would be problematic. However, the MoE (2006: Profile and Trends page 182 and chapter 15 on the Tertiary Education Workforce) shows a breakdown by numbers for different TEO staff categories. The graph suggests that it is feasible to classify staff in terms of main academic grades (eg. Professor/Senior Lecturer/Lecturer), leaving a residual 'other' group which could be excluded from the PBRF.

I suggest that this might be used as an appropriate basis for designating a tighter PBRF-eligible population but the SRG is in a better position to analyse and interpret the more technical and practical challenges of auditing this.

5.5 Submitting the information

Every institution complained about the software that the TEC provided. I understand that this is being addressed in anticipation of 2012 but the TEOs will want to see early versions to trial and test in 2010. I therefore concur with the proposal, received from a group of institutions, that the TEC should provide bulk XML validation software to allow TEOs to test their EPs and should do so at least twelve months ahead of PBRF submission.

The background to this is that, in March 2006, the TEC advised TEOs that EPs needed to be compatible with central software. Although no validation software was provided to allow TEOs to test compatibility, the TEC stated that EPs found not to be compatible with their software would be deemed ineligible for consideration by the panels. The various evaluation tests suggested were either onerous or inappropriate. Problems inevitably arose and some institutions only discovered these at the point of submission.

The EP template needs to be able flexibly to accommodate all the research modes present across institutions and to accept material from different disciplines. This sounds obvious but an interesting point was made to me about the semiotics of the software.

"The templates were for PCs, not Macs. This affects people working in the visual and design areas. It reinforces the 'science' perception." *Senior researcher, Creative arts*

Another, reasonable complaint from researchers concerned the EP format and the way this might be modified after submission. Again, disciplinary nuances can be all important. If the researcher is not certain of the format in which their material will be seen by the panel then this creates quite needless stress.

5.6 The individual as the unit of assessment

Individual assessment has been a stimulus that has produced a rapid and comprehensive reaction across the system. For the PBRF to properly evaluate the research base as a whole and over the longer term, however, I believe that the focus must turn to the research environment and to the support of sustainable excellence. The shift away from the individual will also avoid some unintended consequences.

5.6.1 Individual versus group

The unit of assessment remains a contested area. Reactions to draft proposals show that this is as true in the realm of high policy as it is on the campuses of the TEOs. After circulating draft proposals I received a deluge of new 'commentary' divided between well-informed and established researchers with a strong policy background, who supported the status quo, and a diverse group of middle and junior staff, under-represented in my interviews, who were predominantly unhappy with individual assessment.

My overall conclusion is that the system adopted in New Zealand has been broadly accepted (in my interviews around the TEOs it faced no strong challenge from experienced

academics) but leaves some discontent among the less empowered who see it as a source of uninformed criticism. During my initial meetings, one university ran strongly counter to the common view, both at central and departmental levels. I tested the topic in some detail in my later round of detailed individual meetings and found two different points of view. On the one hand, staff across many disciplines and many institutions see individual assessment as throwing a light on excellence wherever it occurs.

“Individual recognition in ITPs is more effective. Group expression would be total dilution and it’s unlikely to be welcome.” *Research director, ITP*

On the other, senior staff (especially in ‘science’) see a group-based assessment as providing a more informed overview of research performance because analysis at that level captures ‘more than the sum of the parts’.

“The PBRF does not recognise the work to develop the research environment, which gives you a big CRE and no NROs.” *Head of department, Science*

“The sum of individual activity is not a fair assessment and that doesn’t represent the way the funding flows anyway. It makes it more difficult to do the research.” *Senior researcher, Social sciences*

So, there is a problem because individual assessment fails to capture all the information critical to PBRF objectives. It would be of great value if the TEC would ask the SRG to model and review a complementary group-based assessment for any future process after 2012.

Why not change now if change is needed? On balance, I think the individual should remain the unit of assessment for PBRF 2012 because it would be disruptive and create undue short-term cost if it were changed at this stage. The ground-swell for stability means that the cost of change might outweigh any benefit of increased information.

There are three issues to address. First, it would be valuable to include some mechanism to focus on the characteristics of a healthy research environment as well as on excellent individual research. There are many ways that can be devised to reach an appropriate balance between individual and group assessments; the ERI and RDC components already move in this direction but do so on the basis of quantity rather than quality.

The Advisory Group challenged me to say what a healthy research environment would look like. Characteristics like sustainable, flexible, diverse and adaptable spring to mind. It would have a good range of resources appropriate to discipline, an extended age profile through from a substantial postgraduate population to well-established researchers and a track record of research achievement, collaboration and developing people who went on to make contributions elsewhere. It would have good links with both the public sector and relevant industry, contributing tangibly to innovation through IP, products and processes. It would be able to produce clear statements about what is important in its track-record and why its future strategy is valuable to discipline and the economy.

The second issue arises because individual assessment is affecting the recruitment of new researchers and may thereby detrimentally affect sustainability. The third issue is that individual assessment is being used as a substitute for proper staff development, in appraisal and as a driver.

5.6.2 Strong researchers versus sustainable outcomes

A problem with creating an AQS score based on individuals is that the highest average would be achieved if all staff had a long and excellent track-record.

This thinking has led to the shift in the age-profile of the research population detected by the TEC (Çinlar and Dowse 2008b) and it is not a healthy outcome. It makes no sense for a department to consist solely of a group of professors with A-grades and grey hair. There is

no profile of experience; there is no pattern of succession; there is no sustainability. A healthy research environment is, as I noted above, one with a spectrum of age and experience. Established strength is challenged and boosted by innovation and iconoclasm; neophytes are brought on by the well-rooted.

5.6.3 Individual assessment and staff appraisal

“We are supposed to be collaborative and this system should be about judging institutions. Instead it judges individuals, which is inimical to the research process and can foster all sorts of problems.” *Head of research group, Science*

The PBRF fills a staff-development vacuum. NE researchers value the individual feedback, which the PBRF was never intended to provide, but suffer under individual assessment. They have been recruited to be part of a team, because they show promise, and they expect to grow and mature. Suddenly they find themselves typecast as below benchmark at R(NE) or at best C(NE), a blow to morale and jeopardy to their position. The NE label fails to solve the morale problem of being assessed in isolation while new to research.

But it is not just NE researchers for whom the PBRF grading of EPs provides a feedback that is sadly absent from performance appraisal in too many institutions. As I noted earlier in the report, the established researchers are more confident and experienced and do not require this appraisal. (Indeed, two very eminent people independently said they felt no urge to look at their grades – “well they would say that, wouldn’t they!”)

There should be some concern that many people feel that the PBRF is giving them more information than they get from their institutional appraisal and review. The PBRF rating may also – as the AUS has pointed out – implicitly throw responsibility for outcome onto the individual whereas the responsibility for the environment in which they work and the conditions under which they work is really held at a higher level.

“Individual assessment scores are not going to make TEOs take responsibility for staff management. Group assessment will start to enforce a group responsibility for their staff.” *Deputy Vice-Chancellor*

If other recommendations made here are taken up then a future focus may be on the quality and sustainability of the research environment rather than solely on individual achievement. A group-based component would address the meta-environment and sustainability, while suppression of individual scores (Section 5.12 : Handling metrics from individual EPs) would be an alternative option to throw appraisal back on the employers.

5.7 Mapping to panels

I found it difficult to relate scores and outcomes between different levels of granularity in the system and was further confused about the way EPs are redirected between panels. Although the present system seeks to maximise the link between EPs and expertise, I suggest that a greater net benefit might come for PBRF 2012 if a prior assignment process be conducted. If the SRG agrees, then the TEC should require TEOs to indicate the panel to which staff would be assigned.

A shift to group assessment would have implications for the submission and reporting process, because the group would need to be mapped to a panel rather than individuals being mapped. The Nominated Academic Unit (NAU) and subject should be treated synonymously, that is to say that all staff of a given NAU would be assessed by the one panel. Such mapping is desirable, for better reporting of outcomes, but will have implications for interdisciplinary units.

The normal assumption would be that all staff in a department (or school) would be assigned to a single panel. There might be more than one group submitted to a panel where more

than one department mapped together, and these could be taken as a unified group or two (or more) separate populations requiring separate AQS analysis. Institutions might make a case for splitting a department across panels if they felt there was a good case, but this would need to be approved. The reporting would follow the agreed assignment, with scores being grouped by staff within departments.

The pattern of cross-referral (which I distinguish from actual transfer) between panels is high in New Zealand compared to other national assessment systems (see below). This has the effect of increasing workload and also cuts across what some people might expect to see in reporting outcomes.

The outcome of better mapping would be a clearer identification map between staff, their departments and the panels. This does impose on panels the need to review all staff according to their employment location. The overall workload will be reduced, there will be fewer uncertainties about how and where an assessment has taken place and the information outcome will be substantially enhanced.

A counter-argument recognises 'blends' of disciplines where, it is anticipated, the greatest innovation is likely to be. Such areas might include computer graphics or human-machine interfaces. There are no departments constituted around these foci, however, and expertise at the edges of disciplines is still connected back to disciplinary cores.

The increase in cross-referrals in 2006 compared to 2003 ensured that people with relevant expertise in panels other than the originating panel had a chance to offer informed comments on the quality of specific NROs. The question is whether this adds real value. The smaller pool of specific expertise on New Zealand's multidisciplinary panels makes it understandable why cross-referrals could be a larger feature of the NZ assessment process than under the UK RAE, but this is counter-balanced by the much coarser initial granularity of the NZ panels.

5.8 Completing an EP

There was a distinction between staff who generally felt that the EP format was straightforward and who found little problem in gathering the information required, and staff who often found the EP an onerous challenge. This corresponds to a separation between those who have research experience and a track record of grant applications, bids and so on, and those who had been less closely linked to research prior to the PBRF. The latter group included NE researchers, staff from smaller TEOs and staff from disciplines newly required to develop a research base.

Asking for publication lists beyond the 4 NROs was sometimes seen as a problem, because it was believed to signal an expectation of volume which might lead to the generation of spurious outputs to fulfil that expectation. There was also concern about output mode, as noted, and the received impression that journal articles had some primacy in a publication hierarchy. I would point out, however, that the core expectation is not exceptional. It is an almost universal expectation in research assessment that a competent researcher can produce four quality outputs for assessment (without regard to audit periods of 3, 4, 5 or 7 years in different countries).

The other components of the EP are the contribution (CRE) and esteem (PE) elements. Each is separately evidenced. Some researchers found these most challenging, because the sections fitted less readily with the way in which they conceived their research activity. I was frequently referred to the Māori saying that "the kumara does not say how sweet it is": a reflection of a cultural distaste for self-promotion adopted by all New Zealand communities. After two rounds of the PBRF, the CRE and EP elements are now becoming accepted as sensible in intent but remain difficult to package.

"It's a lot of effort for a small score." *Research director, ITP*

“People are taking on administrative duties to fulfil these judgments instead of getting on with their research outputs.” *Head of school, Science*

Sometimes the reported response became perverse.

“There’s a lot of job-splitting going on to work up the CRE indicators.” *Professor, Engineering*

The components are acknowledged to be important and to indicate the value of a wider contribution to the department and community.

“The PE and CRE are an important feature, they encourage collaboration and work against the silo mentality.” *Research director, Social sciences*

I conclude that it is difficult to see how an EP can work with NROs alone. My judgment is that for individual assessment to be effective the researchers must adapt to and adopt the CRE and PE components and evolve effective ways of using them to reflect the other, associated qualities of their research environment. There will be many ways of solving this, according to discipline.

On relative weight, I would increase the weight on NROs, which are somewhat less subjective as evidence, but this is a marginal consideration.

5.9 Subjects and referrals

Current problems of subject mapping increase workload and challenge both the quality of the assessment and the quality of the information available to third parties. I suggest that, to simplify the mapping discontinuities, the SRG might wish to consider the prior assignment of staff to panels according to their department within a TEO.

Mapping is a familiar problem in dealing with research activity data. What is ‘chemistry’? Is it the activity funded by a chemistry committee, the work of people in a chemistry department or the research that leads to papers in a recognised set of journals?

For funding bodies the data cuts one way. For TEOs the data cuts another way. For international comparisons the mapping becomes messy. For the PBRF there seems to be some ambiguity. Do researchers choose where their EP goes? Is the TEC/Panel chair allowed to redirect ‘erroneous’ submissions? Why is a broad-based panel not competent to take all the EPs for a related department? How are the scores aggregated for public consumption?

“It looks damned silly when a university near the top [of the table] doesn’t even have a department in our subject.” *Focus group, Physical sciences*

The point made here was that individual staff were directed to a panel and their score was subsequently reported in that context, but they could be specialists working in a department in a quite different area. So, the PBRF is not maximising information about the structures on the ground either for the TEO that spuriously ‘did well’ or the one with the irritated staff.

Some staff complained that their institution had chosen to direct their EP to a panel they would not have selected, although this might be appropriate if clumsy local management existed. Other EPs appeared to be referred after a review outside the TEO, which is widely believed to have been within the TEC although in fact panel chairs made the final decision on transfers between panels, not the TEC secretariat.

“TEC reserve the right to shuffle people. They should not second guess, although a dialogue is acceptable.” *Professor, Creative studies*

“Sexuality was misunderstood, by TEC we were told. The EP was referred to Social sciences instead of Humanities. This should not have been changed.” *Focus group, Creative studies*

“There is an issue of evaluation context. An EP is written with the specific guidelines of one panel in mind only to be assessed under a different panel with different guidelines.” *Research manager, University*

There were full transfers and there were referrals. I analysed the numbers of EPs that were referred between panels in each round.

- In 2003, 94% of 8,018 EPs were not referred. That means 486 were referred, which seems a lot given the breadth of the panels. There was a cluster between Biological Sciences and Medicine, which is unsurprising. There were many cross-referrals from Education and from Māori Knowledge and Development, which include obvious links to other disciplines.
- In 2006, cross-referrals increased with only 89% of 8,671 EPs being simple and some 1,177 being cross-referred and 123 fully transferred. The biggest single cluster was again Bio/Med, and the largest panel for cross-referral was Education. Māori Knowledge was now much more satisfactorily addressed: there were fewer referrals from this area than for most others.
- In the UK, at RAE2001 there were 1453 cross-referrals and no transfers from 200,000 items (data from HEFCE and from an *Evidence* report on interdisciplinarity).

So, in New Zealand with fourteen broad panels we have more than 10% of EPs being cross-referred while in the UK with 68 narrow panels we have less than 1% of items being referred. This is distinct from ‘transfers’ of which there are some in New Zealand and almost none in the UK. This is an order of magnitude difference, and it is in the opposite direction from that we might predict on the basis of panel scope.

The explanation for this unexpected outcome must lie with the nature of the assessment, based on individuals and not on groups. A group portfolio produces a blending which enables a broad fit between submission and panel structure. An individual stands starkly alone and a chemist may end up in any of a range of locations.

The consequence is researcher discontent: had they been assessed by the most appropriate group? It cannot be satisfactory for the system as a whole that so much cross-referral occurs with the consequent increase in transaction costs and the need to interpret and reconcile complex assessment outcomes. There is also an impact on the reported outcome. What is actually being presented by the TEC under any disciplinary heading?

“I am unsure how they distilled back to get a grade for the discipline.” *Professor, Science*

As I noted in Section 5.7 (Mapping to panels), ‘subjects’ and ‘mapping to panels’ are deeply inter-twined. I suggest that the SRG might review the rate of referrals and consider whether this may be excessive or whether my outsider view may have misconstrued the operation within New Zealand.

5.10 Peer review panels

It is not for a reviewer to criticise work carried out under arduous conditions, poorly recompensed and with only the certainty of criticism from the rest of the community. It is therefore with some caution that I make any suggestions regarding the excellent work carried out by the network of expert and committed individuals who made the peer review panels work. In fact, my conclusions are not that the panels have not worked well but that they should be empowered to work even better.

I suggest that the TEC could be more supportive in training panel members and in ensuring that chairs are active in mediating proper debate. I believe that panels could benefit from the inclusion of more non-academic members from the private sector and adjunct professional areas, but recognise the challenge of achieving this. And, despite the evident cost, I would

advise that PBRF 2012 panels should meet at least once more often than they presently do. The benefit would be to create a stronger corporate feeling amongst panel members and give them greater scope to debate their assessment approach and the assessment outcomes.

I arrived at the view that panels needed strengthening in their resolve from an overall sense from interviews that it might have been useful had panel members recalled the words – drawn to my attention by a researcher in Cultural studies – of Captain Barbosa, in the *Pirates of the Caribbean*:

“[The Pirate code] is more what you'd call 'guidelines' than actual rules.” *Pirates of the Caribbean: The Curse of the Black Pearl* (2003).

The most common criticism was that panels had followed the 'rules' too rigidly, thus appearing simplistic in their behaviour and inflexible in the way they carried out their work. I have referred earlier to the need for panels to be more sophisticated in comparing sub-disciplines, considering applied and policy-led work and assessing practitioner outcomes as well as academic outcomes. I think this is where any correction should be applied to assessment, rather than through formulae, because community interpretation is more informed and responsive than are weighting factors.

The TEC guidelines had been interpreted as a rigid framework rather than a template against which the culture of each research field might be set.

“The panels were able to take on board the narrative of the NROs and recognise disciplinary factors.” “The PBRF system seems to be better able to appreciate disciplinary features than the RAE experience.” *Focus group, Clinical/health*

“People followed the Guidelines but kept within them rather than making flexible professional judgments.” *Senior researcher, Social sciences*

“The Internal Assessor [moderator] told the [relevant area] panel it was 'working well' but this seemed to be about sticking to the Guidelines.” *Panel member*

[There was] “... supine behaviour of the panel in response to reductionist, anti-intellectual guidance.” *Panel member*

“The calibration round [of the moderation process] was the problem. It posited a quantitative assessment model to reviewers.” *Research manager, ITP*

Some of these are subjective perceptions, but others report experience and all are informed by the views and reactions of the wider community. They may be less accurate as a formal representation of the PBRF's procedures but, looking to the 'effects' of the PBRF, they are evidence of those community reactions.

A number of interviewees suggested that a lack of confidence in assuming a judgmental role was attributable to a 'colonial cringe factor'.

“New Zealanders are terrified of their own judgement.” *Professor, Science*

My own perception was that, if this exists, then it is misplaced. After all, there must be a reason why New Zealand researchers are so much in demand.

Part of the problem over panel confidence may arise from adaptation to a new system, and the learning curve panel members had to follow. There was acknowledged to have been improvement throughout the operation between 2003 and 2006.

“In 2006 the panel was more mature and settled in its judgment. Everyone was used to the PBRF by then. People were more ready for the difficulties that arise.” *Panel member*

Not everyone agreed that the variant panel-level guidelines made sense. Several respondents suggested that more consultation across the community should have taken place, and this would be feasible ahead of PBRF 2012.

“Look at the description on page 80. Who wrote this? How was this agreed? No wonder you get cross-referrals and strange ratings.” *Focus group, Creative studies*

There were also issues arising from small panels that knew one another (too) well and had a sparsity of external references. It would be valuable if more non-academic and professional members could be recruited.

“The panel breadth is problematic. If an expert leaves the room [because of conflicts of interest] the panel becomes disempowered.” *Panel member*

“Some discussions tended to refer to disciplinary cues rather than to substance and it was difficult to challenge these claims.” *Panel member*

Panels need appropriate room for debate. It was suggested that there is a tendency to avoid conflict, which may mean settling for compromise (which is undesirable) or not stating contradictory views (which is anathema). In a small and networked community it must be difficult to disagree with people you will certainly be meeting and working with fairly often, but this needs to be addressed if the assessment process is to work.

“... but individual errors cropped up, for example interactions over conflicted interests, or an adamant person took charge and other members then avoided conflict rather than challenging.” *Panel member*

“It is dependent on personalities. Statistical analysis helped, but force of personality meant that one person could dominate. It is difficult to overcome this.” *Panel member*

There were many comments about the compromises required to assemble appropriate panels, and I refer back to the comments made about narrowness of selection and its dominance by universities. Each panel portfolio is wide, so there is a choice between either an unwieldy forum or a narrow range of represented sub-disciplines. This imposes a serious burden and the need for the panels to act in a confident manner is therefore paramount. They must be positive in their individual roles, not allow themselves to be unduly driven by dominant forces, and yet be prepared to seek supplementary guidance.

Confidence in the process would be enhanced if there was an enhanced role for panel members in debriefing the community.

“The language is ‘quality improvement’ but the feedback loop from the panel to staff is not sufficient to get strong information flow.” *Research director, Social sciences*

Finally, I noted above some perceptions of a slightly heavy-handed approach to moderating assessment and outcomes. This runs against clear evidence of a careful and thoughtful moderation structure that responded to the need to demonstrate that there is good comparability across panels. It may be again an issue of familiarity. Each panel is an expert group and it must feel that it has the room to exercise its expertise and is empowered to carry out its job. It should not confuse advice from co-ordinating figures with an attempt to redirect its professional judgment.

5.11 Other variables

5.11.1 External Research Income

ERI has mixed value as an indicator, but within the PBRF provides important flexibility within the assessment cycle.

On the one hand ERI is an input and therefore tells us nothing about achievement. On the other hand, for research, many funding sources are competitive and the acquisition of funding is therefore an indication of both a good quality proposal and success in comparison to other, unfunded applications.

A key advantage to using ERI in the PBRF model is that it provides a responsive annual funding component that balances the longer-term cycle of the quality assessment. This enables researchers in innovative areas to have some prospect of reward in-between main PBRF rounds, which is an important benefit of the New Zealand system.

It must be borne in mind, however, that there is great variation in the funds available to different subjects. The biomedical sciences tend, in most jurisdictions, to have access to greater public research funding driven by health policy concerns and to a wide range of charitable and commercial sources. Other sciences and technologies may also have some access to both additional public funds and to industry. This is less true of social science and humanities.

“The NE researchers are incredibly unlikely to have any ERI within the small pool available in New Zealand.” *Professor, Engineering*

“... there are limits anyway, low limits to the funds available for social and cultural studies in New Zealand.” *Professor, Cultural studies*

If the funds included in the ERI analysis are treated as a single pot then it is inevitable that the bulk of ERI funding would go to clinical/health areas and proportionately less elsewhere. The way this is best redressed is for the funds for distribution under the PBRF to be partitioned and then distributed from a pool within subject area against the ERI. This would avoid the playing field being permanently tilted towards one end.

A criticism levelled by some respondents was that the ERI component represented ‘double-dipping’. I do not agree. The additional funds represent an appropriate incentive which allows those who are successful in getting hypothecated resources also to support some more exploratory work with the prospects that this will lead to further successful applications. This might be pejoratively labelled a ‘Matthew effect’ but rewarding winners is not necessarily a bad thing.

There is a separate question about the scope of the ERI analysis. I believe that it is correct to restrict the scope to the publicly funded research system, and in particular to gear against the complementary parts of Vote RST. Commercially funded research activity required by firms, industries and other end users should be supported at full economic costs and payments should include an incentive for the enhancement of the contributory IP created through the public purse. If there were also an added ERI component then there is a risk that this would become a public subsidy that allowed TEOs to take on commercial work below cost.

5.11.2 Research Degree Completions

It is an appropriate incentive to reward those institutions that ensure that they only take in research students who are likely to be able to complete their degrees and then ensure that they do so in a timely fashion. RDCs are not a clear indicator of research quality, but there are other peer mechanisms to provide appropriate quality assurance.

The presence of the RDC component within the PBRF formula has provided an important incentive for research managers to review the rates of degree completion because the rewards for addressing poor completion rates are – like the ERI component – tangible and rapid.

“The RDC rate was pretty poor [60%] so the cost consequence [of our poor performance] at [TEO] is much tighter tracking and reporting for all PGRs to ensure the rates are elevated.” *Head of department, Science*

“It is now more obvious that PhD students can make a large financial difference. The numbers of these have picked up a great deal to the point where there is a challenge to the quality of supervision.” *Senior researcher, Social sciences*

“You need to know that historically some areas had few PhDs.” *Head of department, Social sciences*

There is a possible risk that an incentive encourages perverse behaviour, in this case the undue growth of research student numbers.

“The weight on RDCs is excessive compared to quality and tends to push towards volume again.” *Research director, Social sciences*

However, the cost of getting a student through the years to a successful PhD seems sufficiently clear to outweigh this.

5.12 Handling metrics from individual EPs

5.12.1 The release of individual scores

The preceding sections identify some possible changes to aspects of the PBRF process which might enhance its effectiveness, but they are largely for debate. However the use of the metrics derived from the assessment is an issue about which I have much more serious concerns (Section 5.6.3: Individual assessment and staff appraisal). In particular, for PBRF 2012, I would recommend that once the EP assessment is complete the scores should be retained only for financial and summative purposes and not for individual feedback.

The effect of this recommendation is that the names of the researchers and the grade information should be separated. The reasons for this are twofold: the TEOs should not be given the personal data, because it is susceptible to misuse; and no feedback should be given to individuals, because the employers should be providing proper and targeted appraisal and guidance. I can call in support the advice of the Association of University Staff (AUS), which has consistently argued against the release of individual scores in any form.

“Any individual ratings of researchers produced by the PBRF assessment may not be used for any other purposes than the PBRF assessment ... Individual scores should only be aggregated for the purposes of overall scores ... and NOT released back to the individual or the institution.” *AUS letter to Minister of Education, 6 December 2002*

This remains the union policy. The 2004 AUS conference review of PBRF policy called for an end to assessment based on the research performance of individuals, and a remit passed at the 2006 Conference called for the “cessation of the PBRF's use of individual evidence portfolios (especially when compulsory) in all future assessments”.

The panels review an EP, apply a score to its components and then a grade. The grades provide the TEC with the metric that it needs for its funding algorithm. The combined grades from a group of staff provide the summative outcome. The detailed information is not used by either of these processes but it has been retained and supplied in confidence to the TEO and for the researcher to access if they wish.

“It’s really a sham if some officers of the University have access to the scores then it’s not confidential.” *Professor, Humanities*

I think it is wholly inappropriate to pass the detailed PBRF scores for named individuals to their institutions. The acknowledged inaccuracies in scoring at individual level, which individuals cannot appeal, raise serious doubts about the value of information in this format. The fact that some staff use these grades in job applications creates a penalty for those not in a position to foreground this apparent accolade. At a local level, it would be quite wrong if such information were to be used for staff appraisal, yet I found two leading research institutions that not only proposed to do exactly this but claimed they were unable to operate unless they did so. I have rarely encountered such a blatant abdication of proper management responsibility nor such willingness on the part of academic institutions to relinquish their autonomy to government and I felt sneaking sympathy with a view that:

[University management is] “incompetent and malicious.” *Head of department*

Because senior management has the information, others want access. In several institutions I was told by line managers that they should have access to the scores of their staff. They were frustrated because the data were known to be available but withheld.

“The grades come to the University but we don’t know the detail. We should. We have to rank the people and this is valuable information.” *Head of school, Science*

“If the university needs to know then why not the heads of department? Why not use them for performance management?” *Head of department, Social science*

In fact, heads of department must have far more information available about the personal profile and circumstances of any individual than a peer review panel could possibly absorb. They are also able to contextualise the activity in terms of research developments in New Zealand and in the field, and sub-field more widely. The scores from a PBRF panel’s review of limited data for a few minutes can be little substitute for proper performance appraisal.

“We must know our staff better than the peer panels do. I would be very worried if the bureaucracy knew and used all this information.” *Professor, Science*

Rightly, those who read drafts of my report have raised questions about New Zealand privacy laws and laws about accessing any personal information held by an agency. If these are a real bar to proper confidentiality then I think this raises questions about the process. Is it right to run a research assessment that creates problems for the researchers? Does the release of these personal data not compromise the likelihood of gaining access to valid information in the future?

5.12.2 Performance appraisal

I was not asked to look at internal management in TEOs but the previous section may indicate why I feel this is a point which must be addressed.

My view is that the development of effective research performance appraisal should be a formal part of strategic planning for all TEOs that receive PBRF funding. The TEC investment managers are in a good position to ask for sufficient information to ensure that this is put in place at all levels in all institutions. I am not a Human Resources expert and I therefore suggest that a consultant with appropriate expertise should be invited to advise on an appropriate reference specification.

Do institutions need the data to evaluate their overall staff profile? If so, then they can have the disaggregated scores in an anonymised form. From this they can work out their strengths and weaknesses, and they can use profiled information in their performance appraisal processes in helping to set targets for staff.

Do staff benefit from receiving their scores? Opinions differ but, as I noted, there is a greater desire for information among the staff who are least experienced, and this therefore reflects a desire for more effective support and guidance across their research activity. Again, I would argue that the scores are no substitute for proper performance management. The scores may in fact be confusing and unhelpful if they are presented without the contextual information which panel members cannot reasonably be expected to give.

5.13 Weighting factors

The terms of reference particularly ask the reviewer to comment on weightings in the PBRF formula.

5.13.1 Weighting factors within the EP and associated components

I received no strong views that the current weightings in the EP are seen as problematic. As I noted, some staff found the CRE and PE elements a challenge when first encountered. Familiarity appears to be overcoming this, as part of a general increase in staff awareness of how they should respond to the EP.

In the absence of an independent assessment of the overall research environment the CRE and PE elements have a role. If any change were to be made, then the weighting should tilt towards the NRO component; the strong quality element should not be reduced.

The weighting of the RDC and ERI components is also relatively uncontroversial, but it might be appropriate for the SRG to review these. There was some feeling that the RDC component is perhaps weighted rather high when there is no clear link to a quality indicator associated with research degrees. I think the risk that it will encourage an increase in volume is probably negligible, but I agree that if the overall PBRF aim is quality then a 25% weighting on the RDC quantity measure seems high. There is a separate concern about the relative amount of ERI available to different subjects and the effect of this on the formula outcome, but that has nothing to do with the weighting in the formula.

My view is that an equal weighting of 15% each for ERI and RDC would be appropriate. I doubt if it would be worth modelling this; it is a matter for academic judgment.

Table 6. The current formula weights for the components of the PBRF assessment

Main component	Weighting 1	Sub-component	Weighting 2
Researcher's evidence portfolio (EP)	60%	Nominated research outputs (NROs)	70%
		Contribution to the research environment (CRE)	15%
		Peer esteem (PE)	15%
Research degree completions (RDCs)	25%		
External research income (ERI)	15%		

5.13.2 Weighting factors – staff grades

Because the PBRF emphasises excellence, I suggest that the SRG might consider whether the weights between EP grades should be modified in the PBRF funding model to increase the gain between “B” and “A” for both reporting and funding purposes.

At present the absolute gain in the PBRF model (for funds or AQS) between “C” and “B” is the same as that between “B” and “A”, and the relative gain is much greater. This does not make good sense. Delivering better research is not a linear function. Research is expensive, good research is very expensive and internationally excellent research costs more than most of us can afford.

To recall, the scores created from reviewing EPs are assembled and dropped into a funding model. The funding weights for “A”, “B” and “C” grades are 5, 3 and 1 (or scaled up to twice that). Thus, it is at present easier and cheaper to invest management time and resources to raise staff performance up from “C” to “B”, and the returns are just as good as from the more costly challenge of shifting up to “A”. The model is therefore one that drives the pursuit of excellence no more than it supports the normal career development of new researchers into the mainstream. The most likely outcome of the present weighting is an increase in lower-end “B”s edged up from “C”.

High-end “B”s are excellent researchers, but a greater differential between “B” and “A” is needed to make it worthwhile for institutions to focus on the development of performance at the very top.

My personal preference would be to change the 5/3/1 ratios to 4/2/1, thereby doubling the gain at successive steps, but a reduction from 3 to 2 for “B” would cause discontent. The simplest alternative is to raise the top end: 6/3/1.

Table 7. The effect on financial return and on AQS of increasing the weighting for “A” grade staff

	Grade			Outcome	
	A	B	C	Money	AQS
Staff weighting 2006	10	6	2		
Initial staff count	2	10	8	96	4.80
Raise 4 staff to A	6	6	8	112	5.60
Raise 4 staff to B	2	14	4	112	5.60
Alternative weighting	12	6	2		
Initial staff count	2	10	8	100	5.00
Raise 4 staff to A	6	6	8	124	6.20
Raise 4 staff to B	2	14	4	116	5.80

This minimal change would enhance the emphasis on excellence. Those that raise their “B”s to “A”s gain both in funding and in their AQS compared to the present model.

5.13.3 Weighting factors – subjects

In the New Zealand system, medicine and engineering are weighted 2.5 while biology and physics are weighted 2.0 (Table 2. page 23). I understand that these funding relativities presently applied to subjects are derived from an analysis of teaching-related data. As I noted earlier in the report (Section 2.2.10: Subject weightings) this may not be the most appropriate baseline for research activity and I suggest that the funding weights applied to subjects be reviewed with a view to clarifying their purpose.

The bands used for funding research in the UK differ from those used for funding teaching. It appears that biomedical research costs about the same wherever it occurs, and physics research is not very different whether it is pure or applied, although it varies hugely within physics (eg. theoretical, laboratory or particle).

“The Council has decided that [subjects] will be assigned to three bands – band A (high cost laboratory or clinical subjects), band B (intermediate cost subjects with a technical, experimental or practice-based element), band C (other subjects). Bands will have cost weights: band A - 1.7; band B - 1.3; band C - 1.0.” *HEFCE Circular 4/97 (Funding Method for Research from 1997-98)*

This may not be the right balance for New Zealand but it does offer a different logic and a different outcome. It would seem to be timely for the TEC to revisit the current PBRF weightings and to determine whether they remain appropriate. I understand that the MoE has planned to do this at some stage but that analysis has been postponed.

5.14 Reporting

I have referred above to a number of possible changes that would affect reporting outcomes. I have no problems with the style and coverage of the current reporting format, which is a mine of useful information, but I think the content can be enhanced. One of my concerns is that the existing report (TEC, 2007) is not as informative as it should be and can be confusing. Some earlier recommendations on core staff eligibility, staff assignment to subjects, and grade weightings would, in my view, help to resolve this.

My concern arose because I was unable to translate between some of the tables of subject-area results, the nominated academic units and real units of TEO websites. It would be invidious to name any particular institution, but some of the reported data seemed to have been collated more to obscure than to aid interpretation. Very highly-aggregated colleges with over 200 staff gave me little clue to what I would find when I visited a campus.

I have suggested a route to the prior assignment of staff to panels, linking their departments to subject areas (Section 5.7 : Mapping to panels). If this is then used by the TEC to police the aggregation of data and applied to translate the outcomes into reporting for 2012 then I suspect the outcome will be much more useful for many different groups of stakeholders.

Another issue is materiality, and a threshold for reporting is probably justified. Without reporting limits there is potential for TEOs with fewer than eg. 10 PBRF-eligible FTE-weighted staff to appear as the highest ranking TEO by FTE-weighted quality score. This is probably not an informative result from a public perspective

In summary, the format of the post-PBRF report should not change to any great extent but the input to the report would be modified (a) by changes to staff eligibility, to ensure that standard and widely-understood cohort was assessed across subjects and institutions, (b) if the eligible staff were pre-mapped to NROs and their EPs were assessed within the relevant panel, and (c) if a higher volume threshold was applied to reportable outcomes to remove small-volume outliers.

6 Closing remarks

6.1.1 Positive outcomes

The evidence from the wide range of interviews that I conducted shows that the government's objectives for the PBRF are being met on most counts and the secondary data analyses of the TEC reveal no undue negative effects. There have been beneficial formative effects on the behaviour of individual staff and on the processes and mechanisms used to support research within institutions. If the PBRF assessment does privilege or disadvantage specific institutions, modes of research and groups of researchers then it does not do so in ways that the panels cannot address.

The first phase of the PBRF has delivered a great deal. A number of possible modifications might be explored with a view to enhancing the focus on sustainable excellence and increasing the information provided to stakeholders.

From the comments made to me, my view is that if the PBRF had not been introduced then the emphasis on teaching and on student numbers that is said to have characterised the New Zealand tertiary system in the 1990s would have persisted. The consequence of this was that research was seen as an adjunct activity rather than core, that some staff were only slightly engaged in research and they took little cognisance of international standards of excellence. Many interviewees commented on the extent to which the PBRF has changed these attitudes. So, in terms of a 'null hypothesis' ("what would have happened in the absence of the PBRF?") we can say that the assessment process has been influential.

Several commentators have asked why we cannot point to specific international comparative indicators that reflect the PBRF's benefits. I have made extensive use of such indicators, particularly in an annual report on the status of the UK research base relative to a basket of some 30 countries. My experience in using these data is that most national systems have a great deal of momentum and that even significant changes take some time to show up in the data. There is also an intense level of international competition, particularly in the Asia-Pacific region, and my view for the UK is that it will be doing well if it simply maintains its current position. In New Zealand, it will be another three to five years before indicator-based evidence of the PBRF's effect will become clear.

6.1.2 Negative effects

I do not assert that the PBRF's effect has been entirely beneficial.

There are some issues in regard to the ITPs which have been discussed earlier in the report, (Section 4.1 : Effect on institutions) and which have raised some questions about the relative status of different kinds of research (Sections 4.3.4 and 4.3.5). These are not really negative effects so much as predictable consequences of the underlying model, but they indicate that there is some lack of clarity about why the PBRF focuses on a particular aspect of research outcomes – international standards of excellence in fundamental research – and what this is supposed to deliver for the wider economy.

Focussing on the individual as a unit of assessment has two negative aspects (Section 5.6 : The individual as the unit of assessment). One is that the TEC staff data suggest that there is now an undue focus on staff with established track records, which undermines a sustainable profile of age and experience across a department. The second is a consequence of then releasing the individual scores (Section 5.12 : Handling metrics from individual EPs), which undermines proper staff development processes in some institutions.

There is some valid concern about the extent to which assessment processes cause researchers to look to a narrower range of outputs, preferring journal articles and preferring journals on the Web of Science database. A similar concern has arisen in almost every

country that has introduced research assessment. The corrective reaction is for the community to reflect on its conception of quality, to recognise that excellence can be captured in a variety of ways and for panels then to reflect this in their guidance statements and in their work. Excellence needs to be interpreted by the peer review panels, which need to act confidently on behalf of their community and interpret excellence in policy-based research and professional practice (Section 5.10 : Peer review panels).

6.1.3 A problem of policy

For an outsider (and insiders: for inspiration and detail see Callaghan, 2007), concern is raised by the extent to which the research debate in New Zealand is focused on utilitarian short-termism and functionality. This is a policy that delivers today's solutions for yesterday's industries. This is not investment in the future.

With 4.25 million people (see Statistics New Zealand Tatauranga Aotearoa), New Zealand has a small research community that nonetheless has an incredibly high level of achievement. It is right and proper that the government should seek to sustain that record. However, the broader economic context is not as supportive of research as might be anticipated.

The New Zealand economy is characterised by low GDP per capita (about 80% of the OECD and EU-15 averages) and low GERD (Gross Expenditure on R&D) as a proportion of GDP (GERD is about 1.2% compared to an average for the EU-15 of about 1.8%). The relative GDP per capita was similar to western Europe in 1980 but has inexorably fallen over several decades as the developed world's economy has raced away from a reliance on primary productivity. The industries on which New Zealand relies are based on commodity exports and have low margins of profit, little opportunity to raise their contribution to the economy without a devastating impact on the country, and an unhealthy dependence on public-sector R&D. An exceptionally low proportion of GERD is in BERD (the fraction contributed by the business sector).

There is limited prospect of attracting major conventional industries to New Zealand. The basic cost of plant is high, labour is relatively expensive, resources are scarce and transport would be costly. Because the system lacks the benefits of domestic scale, and because finance is therefore also constrained, many exciting research-based start-ups are harvested by other economies, particularly Australia, before they have time to grow and mature.

The government's investment in directed research supporting primary industries, such as the New Zealand Fast Forward programme announced during this review runs to some \$700 million capital investment over 10-15 years and is aimed at opportunities for value-added technologies and expertise in the pastoral and food sectors that could be highly knowledge-intensive and reap significant productivity gains. But it will not diversify New Zealand's economy and it will not create new and stimulating opportunities. That has to come from innovation in a knowledge-based economy.

6.1.4 What universities do

The Tertiary Education Strategy 2007-2012 says:

“we need to shift our focus from a reliance on commodities ... capitalising on the intellectual resources of our tertiary education sector is critical.” (*MoE, 2007: page 38, para 8*)

“As well as being a significant producer of research, the tertiary education sector has a significant contribution to make in training the next generation of researchers and upskilling the research workforce. ... It will ensure that tertiary graduates are provided with the relevant skills ... that allow high quality research and innovation to take place.” (*MoE, 2007: page 38, para 12*)

The reason why investment in the tertiary research base, largely concentrated in universities, is valuable is that it is not a direct investment in any particular area of research. There is no dependency on any specific industrial sector to get a return on this money. Indeed, those who conceive of the PBRF as a fund that underpins or should be directed towards particular disciplines are part of the constraining utilitarian mind-set and wholly misunderstand the purpose of the tertiary sector.

Investment in tertiary research is an investment in people. What TEOs do that no other organisations can do is that they produce people, and they produce very highly-skilled people, people trained in finding and using knowledge to solve problems, people who can do all sorts of things all over the economy. Allocating funds against assessable research excellence in TEOs underpins a key characteristic and purpose of the idea of a university: teaching in an atmosphere of research (Newman, 1852).

New Zealand is characterised by a ‘can do’ culture that is lacking in so many countries. That is why its young people are valuable employees wherever they go. There is a willingness to apply standards, look for improvements, identify problems and solve them that is far from universal. This is the country’s most valuable resource. What the TEOs all do is to take that talent and develop it. What research-rich universities do is to take that talent and turn it into highly knowledge-capable people.

Like New Zealand, the UK also appears to have rather low GERD and a disappointing level of BERD. This is partly a consequence of having moved more quickly away from traditional industry than other western economies. It is a knowledge-economy and its R&D intensive businesses are absorbing a high proportion of its science graduates (Adams and Smith, 2007). There are complaints about the numbers of physics PhDs going to work in the City of London. Companies locate to the city to draw on that talent pool. R&D has changed and is now difficult to index in conventional Frascati terms (OECD, 2002) but it still needs the same kinds of minds to create value.

What New Zealand can be is a haven for companies that need these kinds of people. There is a global war for talent but knowledge can be sourced anywhere and costs nothing to move around. The TEOs can produce the kinds of people who will constitute the flexible, agile, highly-skilled talent pool to draw in new companies.

6.1.5 Implications

The PBRF is about sustaining an internationally-excellent research environment.

PBRF and CoREs initiatives “have helped university-based research in particular to focus on achieving excellence.” (*MoE, 2007: page 39, para 2*)

The implication of this is that alternative processes would be required to support the complementary but different missions in ITPs (Section 4.1 : Effect on institutions) and wānanga (Section 4.5.3: Wānanga).

Neither the ITPs nor the smaller TEOs have any overwhelming enthusiasm for the PBRF, but they are obliged to respond to the Education Act and the explicit identification between teachers and researchers. In terms of their missions, and the relevance of those missions to the development of the New Zealand workforce and economy, this seems unhelpful and unnecessary.

“New Zealand has to decide what it wants the polytechnics to do and then decide how it will support that mission.” *Senior staff group, ITP*

Much time is spent on an assessment which provides limited information, limited resources to participants and some insults to morale. The consequence is the rightful identification of excellence in many places, but that then means resources are directed to an implicit growth of capacity beyond a core research network that is already short of funds. Does New

Zealand really want to grow research capacity across the ITP sector? How does it propose to do so without undermining the capacity that exists in the universities?

Similarly, if the PBRF is about supporting an environment in which people can be exposed to cutting-edge research and develop their knowledge competency then that means that the PBRF is not about rewarding work with industry – however desirable – unless that also produces excellence (Section 4.3.5: Working with users). Utility is not a sufficient criterion for a high rating within the PBRF context: utility produces its own rewards and if users do not want to pay then it has to be assumed that they do not find value.

6.1.6 Funding levels

My reading of the 2008 budget announcements on the PBRF indicates that the government is doing little more than increasing the size of the PBRF to match inflation over the next four years. If this is so, then this is a disappointing outcome, notwithstanding a modest boost in 'new' money in real terms in one or two earlier budgets. I conclude that the PBRF fund may not grow sufficiently to drive the outcomes that policy expects.

As an outsider, I see the PBRF as an implicit compact between government and TEOs. TEOs comply with the requirements of an assessment process that government believes will drive research improvement, with policy expressed in the Tertiary Education Strategy. Better research costs more money, and that emergent demand will inevitably rise faster than inflation in the economy generally. If there is to be the further gain that the economy requires, then government should create impetus by rewarding the improvements at a sufficient level. If it does not do so, then it cannot expect the sector to continue to deliver improvements.

In the preceding sections I have noted some evidence that, while there has been significant change in the research base, the change process is not being sustained in all areas. The problems stem from a weak signal, or feedback loop, to individual researchers about the benefits of doing excellent research. The research base depends on effective buy-in from individuals, because the excellence comes from their commitment through their ideas and projects: innovation is not a command decision. People need to see that their personal investment and commitment is matched by government's investment and commitment, reified through institutional reward systems.

Academics tend to be more interested in professional progress than personal gain. The reward they want to see is not so much salary as the resources that enable them to do more, better research. The institutions cannot deliver this unless they have sufficient flexibility. Most of the universities have started to put effective local research-funding mechanisms in place and yet their staff already note that the initial boost to research is beginning to falter.

A further problem, the consequence of a small number of major players in the system, is that the universities are in a "Red Queen" race. They are running as fast as possible against one another just to stay in the same place.

"Improvement in quality does not mean an improvement in funding if everybody else improves." *Senior management team, University*

It is a blow to morale to know that you have done everything possible to respond to government stimuli and yet to see no tangible benefit, save not losing any resources to competitors.

The outcomes of the PBRF are positive and its negative effects can be remedied. The negative effects of failing to add the necessary fuel to empower this stronger research engine for New Zealand are likely to be more serious and to offset the clear gains in research culture, activity and outcome that have been made in such a very short time.

Annex 1. Terms of Reference

Introduction

The primary aim of the Performance-Based Research Fund (PBRF) is to encourage and reward research excellence in the tertiary education sector within New Zealand. This entails assessing the research performance of tertiary education organisations (TEOs) and providing funding on the basis of their performance. An assessment of the quality of tertiary education research through submission of Evidence Portfolios has occurred in 2003 and a further partial round has been implemented in 2006.

The Tertiary Education Commission Te Amorangi Mātauranga Matua (TEC) manages, implements and evaluates the PBRF on behalf of the New Zealand Government.

Background to Review

The government called for periodic review when it agreed to create the PBRF and an evaluation strategy was consequently developed by the Ministry of Education (MoE) and the TEC. This featured three phases. The first phase was to cover the implementation of the new fund. The second was intended to give a sense of emerging effects and any unintended consequences, while the third is to be a longer-term assessment of outcomes.

The requirement for three evaluation phases – and for two of those phases to be conducted at an early stage in the implementation of the PBRF – reflected a number of concerns that arose during the original policy design. The requirement for the first phase of the evaluation recognised the complexity of the system and hence, the need to ensure that it was implemented in a way that was in keeping with the policy goals and in a way that kept the inevitable additional compliance costs to a minimum. The second phase was intended to examine a number of concerns that had been identified during the policy development. The third phase of the evaluation is longer-term and is intended to assess whether the policy has succeeded in achieving the policy intent government sought in creating the PBRF - in simple terms, has the PBRF been successful in lifting research excellence and if so, has the extent of the improvement justified the effort.

The 'second phase' of the evaluation is being implemented as an independent strategic review of the positive and negative effects of the PBRF on the sector. The review comprises two main elements. The first is analysis of secondary data held by the TEC and the MoE such as Evidence Portfolios, the PBRF censuses, and the single data return (SDR). A schedule of research reports is currently being developed. In addition, symposia have been held in 2006 and 2007 bringing together recent research on the PBRF. The second element of the review draws on the available secondary data analysis as well as collecting the views of informed stakeholders in the sector to reflect the different contexts of TEOs. This approach is expected to minimise the participation costs associated with other evaluative approaches to data collection whilst at the same time addressing the sector requirement for impartiality.

Purpose

The purpose of the review is to meet the cabinet requirements and ministerial directives that apply to the evaluation of the PBRF.

Scope

The scope for the review is:

To identify the overall effects of the PBRF on the tertiary education sector, including positive and negative effects in relation to the management of research and human resources in TEOs. Specific issues to be examined as required by the ministerial instructions are:

- Undesirable consequences of the PBRF particularly for new and emerging researchers (NEs), humanities/social sciences disciplines; professional schools (for example health) and other areas of concern for the sector such as the effects of the PBRF on human resources;
- Impacts on 'risky and innovative research' in line with the Tertiary Education Strategy priority 4 "Improving research connections and linkages to create economic opportunities";
- Impacts on provider engagement with the community, or on the contribution of academics to administration within their institution;
- Impacts on Māori and Pacific Peoples researchers.

To identify whether the current PBRF system could be improved, and in particular examine:

- Weightings for the three components of the PBRF: the Quality Evaluation, research degree completions, and external research income, including the subject-area cost weightings that apply to the Quality Evaluation and research degree completions;
- The individual as the unit of assessment;
- The design and implementation of the processes and procedures for the 2006 Quality Evaluation, and whether and how these processes and procedures might be improved for the proposed 2012 Quality Evaluation.

The review involves consultation with stakeholders across the sector. It draws on the analysis of secondary data undertaken by the TEC and the MoE, and other available research. The review is a relatively brief high level independent assessment of the PBRF undertaken over a three-month period. The review will be guided by the following principles:

- it will be cognisant of participation costs upon the sector;
- it will be inclusive of all TEO types that are part of the PBRF; and
- It will utilise all information that is made available to it in its deliberations.

Project Governance

The review is advised and guided by the PBRF Review Advisory Group with the project sponsor having overall governance responsibility. The composition of the Advisory Group for this review includes representatives from key parts of the sector; an external evaluation adviser; and representatives from the TEC and MoE.

Outputs

The review will produce a final report for the Phase Two evaluation which will state findings from the review and identify options for future work. This report will be published. The report will also inform any necessary future PBRF policy redesign or development.

Requirements of sector

The review will, as far as possible, utilise existing secondary data both publicly available and available within the TEC and MoE. This data source will be enriched through the findings from key informant interviews with sector stakeholders.

Annex 2. Members of the Review Advisory Group

Person	Organisation
David Skegg	University of Otago, Vice Chancellor
Frannie Aston	Tertiary Education Commission, Group Manager responsible for the PBRF
Keith Baronian	Institutes of Technology and Polytechnics New Zealand
Jonathan Boston	Victoria University Wellington, Professor
Lesley Campbell	Tertiary Education Commission, Group Manager (Project Owner)
Rebecca Matthews	Association of University Staff, Policy Analyst
Chris Milne	ARTD Consultants, Expert Advisor
Roger Smyth	Ministry of Education, Manager – Tertiary Sector Performance and Reporting team
Barbara Tebbs	Tertiary Education Commission, Director – Stakeholder Engagement and Investment Guidance Directorate (Project Sponsor)

Annex 3. Peer review panels

Panel	Subject areas	Number of members
Biological Sciences	Agriculture and other applied biological sciences Ecology, evolution and behaviour Molecular, cellular and whole organism biology	14
Business and Economics	Accounting and finance Economics Management, human resources, industrial relations, international business and other business Marketing and tourism	17
Creative and Performing Arts	Design Music, literary arts and other arts Theatre and dance, film and television and multimedia Visual arts and crafts	9
Education	Education	11
Engineering, Technology and Architecture	Architecture, design, planning, surveying Engineering and technology	16
Health	Dentistry Nursing Other health studies (including rehabilitation therapies) Pharmacy Sport and exercise science Veterinary studies and large animal science	15
Humanities and Law	English language and literature Foreign languages and linguistics History, history of art, classics and curatorial studies Law Philosophy Religious studies and theology	21

Panel	Subject areas	Number of members
Māori Knowledge and Development	Māori knowledge and development	9
Mathematical and Information Sciences and Technology	Computer science, information technology, information sciences Pure and applied mathematics Statistics	15
Medicine and Public Health	Biomedical Clinical medicine Public health	14
Physical Sciences	Chemistry Earth sciences Physics	13
Social Sciences and Other Cultural/Social Studies	Anthropology and archaeology Communications, journalism and media studies Human geography Political science, international relations and public policy Psychology Sociology, social policy, social work, criminology and gender studies	20

Annex 4. Tertiary Education Organisations in this review

This table shows the extent of coverage for TEOs. In some cases there were site meetings with researchers, including members of the senior management team (SMT). In other cases, the TEO was able to share a forum with other similar organisations or members of the SMT were able to join a meeting at the TEC in Wellington.

	Focus group	Research visit	SMT meeting	Forum
AIS St Helens				
Anamata				
Auckland University of Technology				
Bethlehem Tertiary Institute				
Bible College of New Zealand				
Carey Baptist College				
Christchurch Polytechnic Inst of Tech				
Eastern Institute of Technology				
Good Shepherd College - Te Heparā Pai				
Lincoln University				
Manukau Institute of Technology				
Massey University				
Masters Institute H/o				
Nelson Marlborough Inst of Technology				
Northland Polytechnic				
Otago Polytechnic				
Pacific Intl Hotel Mgmt School				
Te Wānanga O Aotearoa				
Te Whare Wānanga O Awanuiārangi				
The Open Polytechnic of New Zealand				
Unitec New Zealand				
University of Auckland				

	Focus group	Research visit	SMT meeting	Forum
University of Canterbury				
University of Otago				
University of Waikato				
Victoria University of Wellington				
Waikato Institute of Technology				
Whitecliffe College of Arts and Design				
Whitireia Community Polytechnic				

The reviewer is grateful to all the staff who gave up so much time, not only in meetings but in the thoughtful gathering of views and reflection on the evidence that might help to guide the review and in subsequent communications.

Annex 5. Interviewees

Professor Max Abbot	Auckland University of Technology
Professor Cliff Abraham	University of Otago
Dr Dharamvir Ahluwalia-Khalilova	University of Canterbury
Jenny Aimers	Otago Polytechnic
Dr Airini	University of Auckland
Professor Rob Allen	Auckland University of Technology
Adrienne Anderson	University of Waikato
Dr Helen Anderson	Manukau Institute of Technology
Professor Mark Apperley	University of Waikato
Professor Richard Archer	Massey University
Dr Clare Atkins	Nelson Marlborough Institute of Technology
Professor Mike Austin	Unitec New Zealand
Professor Jack Baggaley	University of Canterbury
Keith Baronian	Christchurch Polytechnic Institute of Technology
Professor Dick Bellamy	University of Auckland
Prof Roy Bickerstaffe	Lincoln University
Dr Jennie Billot	Unitec New Zealand
Distinguished Professor Brian Boyd	University of Auckland
Dr Maxine Bryant	University of Canterbury
Dr Russell Burton	Science New Zealand
Dr Ed Butler	Science New Zealand
Professor Paul Callaghan	Victoria University of Wellington
Prof Keith Cameron	Lincoln University
Professor Carol Cardno	Unitec New Zealand
Professor David Carnegie	Victoria University of Wellington
Professor Lex Chalmers	University of Waikato
Professor John Chen	University of Auckland
Professor Delwyn Clark	University of Waikato
David Cook	Waikato Institute of Technology
Professor Michael Corballis	University of Auckland
Ms Nanette Cormack	Association of University Staff
Stephen Cox	Unitec New Zealand
Professor Roy Crawford	University of Waikato
Professor Kathy Crosier	University of Auckland
Dr Owen Curnow	University of Canterbury
Dr Des Darby	Science New Zealand
Professor Brian Darlow	University of Otago
Professor Charles Daugherty	Victoria University of Wellington
Professor Tim David	University of Canterbury
Professor Michael Davies	University of Auckland
Merran Davis-Havill	Waikato Institute of Technology
Robin Day	Otago Polytechnic
Professor Olaf Diegel	Auckland University of Technology
Professor Jeremy Diggle	Massey University
Mike Doig	Science New Zealand
Assoc Professor Alison Downard	University of Canterbury
Merv Duffy	Good Shepherd College - Te Heparā Pai
Dr Grant Duncan	Association of University Staff
Professor Mason Durie	Te Kahui Amokura

Assoc Professor Denis Dutton	University of Canterbury
Shane Edwards - Kaihautu - Marautanga	Te Wānanga o Aotearoa
Professor Zoltan Endre	University of Otago
Professor Tanya Fitzgerald	Unitec New Zealand
Zelma Foo	The Open Polytechnic
Doug Franz	Massey University
Professor Frank Frizelle	University of Otago
Flora Gilkison	Pacific International Hotel Mgt School
Dr Travis Glare	Science New Zealand
Assoc Professor Keith Gordon	University of Otago
Dr David Gough	Christchurch Polytechnic Institute of Technology
Ms Lexie Grudnoff	University of Auckland
Dr Laurie Guy	Carey Baptist College
Associate Professor Mavis Haigh	University of Auckland
Dr Richard Hamilton	University of Auckland
Professor Robert Hannah	University of Otago
Assoc Professor Lyall Hanton	University of Otago
Professor Jane Harding	University of Auckland
Associate Professor David Harper	Victoria University of Wellington
Dr Roland Harrison	Lincoln University
Dr Phil Hart	Science New Zealand
Assoc Professor Richard Hartshorn	University of Canterbury
Dr Sharon Harvey	Auckland University of Technology
Professor Nigel Haworth	Association of University Staff
Dr Mary Hill	University of Auckland
Professor Keith Hunter	University of Otago
Assoc Professor Mark Jackson	Auckland University of Technology
Dr Susan Jacobs	Eastern Institute of Technology, Hawkes Bay
Professor Annamarie Jagose	University of Auckland
Dr Kuni Jenkins	Te Whare Wānanga o Awanuiārangi
Mick Jenkins	Te Whare Wānanga o Awanuiārangi
Dr Joce Jesson	University of Auckland
Professor Peter Joyce	University of Otago
Professor Annemarie Jutel	Otago Polytechnic
Assoc Professor Pare Keiha	Te Kahui Amokura
Associate Professor Paul Kench	University of Auckland
Dr Chris Kirk	Lincoln University
Professor Joerg Kistler	University of Auckland
Assoc Professor Henrik Kjaergaard	University of Otago
Sandre Kruger	Anamata
Professor Steve LaGrow	Massey University
Professor David Lambert	Massey University
Professor Thomas Lange	Auckland University of Technology
Dr Mark Laws	Te Whare Wānanga o Awanuiārangi
Gina Smith Lawson	Te Whare Wānanga o Awanuiārangi
Associate Professor Wendy Lawson	University of Canterbury
Dr Jonathan Leaver	Unitec New Zealand
Professor Nigel Long	Massey University
Doug MacLeod	Unitec New Zealand
Jacqueline Margetts	Unitec New Zealand
Dr Barry Marlow	Science New Zealand
Dr Bob Marshall	Eastern Institute of Technology, Hawkes Bay

Professor Iain Martin	University of Auckland
Dr Kay Morris Matthews	Eastern Institute of Technology, Hawkes Bay
Professor Hirini Matunga	Te Kahui Amokura
Professor Don McClelland	Massey University
Professor Stuart McCutcheon	University of Auckland
Dr Adrian McDonald	University of Canterbury
Professor Gael McDonald	Unitec New Zealand
Professor Charles McGhee	University of Auckland
Associate Professor Liz McKinley	University of Auckland
Professor Carol McVeigh	Massey University
Katy Miller	Victoria University of Wellington
Associate Professor Raymond Miller	University of Auckland
Associate Professor Ed Minot	Massey University
Associate Professor Maureen Montgomery	Association of University Staff
Professor John Morrow	University of Auckland
Professor Roger Mulder	University of Otago
Professor David Murdoch	University of Otago
Dr Rob Murdoch	Science New Zealand
Professor Alan Musgrave	University of Otago
Associate Professor Jenny Neale	Victoria University of Wellington
Professor Karen Nero	University of Canterbury
Professor Anne Noble	Massey University
Dr Dominique Noiton	University of Waikato
Professor Melanie Nolan	Victoria University of Wellington
Dr Val Orchard	Science New Zealand
Hana O'Regan	Christchurch Polytechnic Institute of Technology
Professor Dorian Owen	University of Otago
Dr Surya Pandey,	Waikato Institute of Technology
Dr Mary Panko	Unitec New Zealand
Dr Rachel Patrick	Whiteria Community Polytechnic
Dr Dorothee Pauli	Christchurch Polytechnic Institute of Technology
Professor Neil Pearce	Massey University
Prof Harvey Perkins	Lincoln University
Mr Jim Peters	Te Kahui Amokura
Dr David Phillips	Unitec New Zealand
Jacquie Phipps	Whitecliffe College of Arts and Design
Dr Andy Pratt	University of Canterbury
Professor Sharman Pretty	University of Auckland
Professor Neil Quigley	Victoria University of Wellington
Tom Rainey	Christchurch Polytechnic Institute of Technology
Professor Ian Reid	University of Auckland
Assoc Professor Mike Reid	University of Canterbury
Professor Mark Richards	University of Otago
Sharn Riggs	Association of Staff in Tertiary Education
Professor Paul Rishworth	University of Auckland
Dr Mike Roberts	AIS St Helens
Mr Darryn Russell	Te Kahui Amokura
Assoc Professor Greg Russell	University of Canterbury
Dr. Theresa Sawicka	Victoria University of Wellington
Dr Christoph Schnoor	Unitec New Zealand

Dr Teresa Schwellnus	Christchurch Polytechnic Institute of Technology
Professor Piri Sciascia	Te Kahui Amokura
Ross Scobie	Northland Polytechnic
A Scott	Science New Zealand
Jo Scott	Association of Staff in Tertiary Education
Fionna Scott-Milligan	Whitecliffe College of Arts and Design
Dianne Scouller	Masters Institute
Professor Gregory Seymour	University of Otago
Professor Ian Shirley	Auckland University of Technology
Professor David Skegg	University of Otago
Dr Andrew Smith	Bethlehem Tertiary Institute
Distinguished Professor Graham Smith	Te Whare Wānanga o Awanuiārangi
Professor Linda Tuhiwai Smith	Te Kahui Amokura & University of Waikato
Professor Rob Smith	University of Otago
Associate Professor Willie Smith	University of Auckland
Dr Margaret Southwick	Whiteria Community Polytechnic
Dr Kevin Stewart	Waikato Institute of Technology
Professor Doug Sutton	University of Waikato
Gloria Taituha - Kaiarahi - Raranga	Te Wānanga o Aotearoa
Professor Felix Tan	Auckland University of Technology
Dr Rawiri Taonui	Te Kahui Amokura
Carla Te Anga - Pou - Te Whirirau	Te Wānanga o Aotearoa
Kahutoi Te Kanawa - Kaiarahi Rangahau	Te Wānanga o Aotearoa
David Thomson,	University of Otago
Dr Sarah Jane Tiakiwai	Te Whare Wānanga o Awanuiārangi
Tangi Tipene	Association of Staff in Tertiary Education
Professor Ian Town	University of Canterbury
Diana Waipara	Anamata
Dr David Weir	Christchurch Polytechnic Institute of Technology
Professor Geoff White	University of Otago
Professor Bryce Williamson	University of Canterbury
Dr David Wiltshire	University of Canterbury
Professor Christine Winterbourn	University of Otago
Claire Worsfold	Lincoln University
Judy Yarwood	Christchurch Polytechnic Institute of Technology
Dr Raymond Young	The Open Polytechnic
Dr Ruth Zanker	Christchurch Polytechnic Institute of Technology
Professor Ted Zorn	University of Waikato

Annex 6. The review instrument

Review of the Performance-Based Research Fund

A review of the Performance-Based Research Fund (PBRF) is currently being undertaken by the Tertiary Education Commission Te Amorangi Mātauranga Matua (TEC). As part of this, the reviewer will meet a number of informant groups and would like to invite informants to consider a number of questions prior to the meetings.

Purpose and approach

The purpose of this document is to describe the intent and objectives of the current independent strategic review of the PBRF and as part of that review to provide a direction for informants involved in face-to-face interviews or focus groups, to provide their own inputs to the process. This document assumes that the reader/informant to the review holds some knowledge of the PBRF background, process and systems. Guidance to this information is given below.

This document includes some background information and a description of the main areas, or themes, which Government has asked that the review should address. The thematic structure and approach is being used in order to collect views in a way that will allow appropriate comparability between respondents and that will support the development of an effective evidence base to report to Government.

The themes which respondents are invited to consider are set out below. Questions under each theme are intended to focus responses within the interviews and focus groups, but it is not expected that responses will necessarily cover all of, or be restricted to, these topics. Not all respondents will necessarily wish to address all questions and respondents may wish to raise other topics not covered here.

Informants may wish to consult informally with colleagues who are not attending the face-to-face interviews or focus groups regarding the themes identified below.

Background to the current review

The primary aim of the PBRF is to encourage and reward research excellence in the tertiary education sector within New Zealand. The research performance of tertiary education organisations (TEOs) is assessed and funding is provided on the basis of that performance assessment. More information regarding the process used in the PBRF is available here: <http://www.tec.govt.nz/templates/standard.aspx?id=597>.

The TEC manages, implements and evaluates the PBRF on behalf of the New Zealand Government. More information regarding the background and purpose of the PBRF, its mechanisms and the results of the quality evaluations are available at: <http://www.tec.govt.nz/templates/standard.aspx?id=588>. A first evaluation of the quality of tertiary education research through submission of Evidence Portfolios took place in 2003 and a further partial round was implemented in 2006.

To meet the requirements of ministerial and cabinet instructions, the TEC and Ministry of Education (MoE) developed an evaluation strategy for the PBRF. The evaluation strategy has three phases. The first phase was to cover the implementation of the new fund. A report is available on this work at <http://www.tec.govt.nz/upload/downloads/eval-of-implementation-pbrf-and-2003-quality-eval-conduct.pdf>. The second is intended to give a sense of emerging effects and any unintended consequences, while the third will be a longer-term assessment of outcomes.

The various phases of the evaluation strategy reflect concerns that arose during the original policy design. First, the system is complex, there is a need to ensure that implementation is in keeping with the policy goals and compliance costs should be minimised. Second, issues identified during the policy development need to be examined. Third, longer-term evaluation

should assess whether the policy has succeeded in achieving the policy objective of lifting research quality and, if so, whether the improvement justified the effort.

This document refers to the 'second phase' of the evaluation, which is being implemented as an independent strategic review of the effects of the PBRF on the sector (see: <http://www.tec.govt.nz/templates/standard.aspx?id=2547>).

The review comprises three main elements:

- Interviews and focus groups with informants, in the sector and outside, to reflect the different contexts of TEOs and their research.
- Collection of written submissions from the widest possible range of interested parties including TEOs, learned societies and organisations representing research users.
- Analysis of secondary data sources. These include but are not limited to those held by the TEC and MoE such as EPs, the PBRF censuses, and the single data return (SDR).

This approach is intended to minimise the participation costs associated with other approaches to data collection whilst at the same time addressing the sector requirement for impartiality.

The review is led by an independent international expert, Dr Jonathan Adams, Director of *Evidence* Ltd, a UK-based research consultancy with extensive experience of working with tertiary education institutions in Europe (<http://www.evidence.co.uk/>). The information collected in the process outlined above will be synthesised in a review report due in June 2008.

Thematic structure

1. Overall effects of the PBRF on the tertiary education sector

This theme focuses on the PBRF's effects across the system as a whole.

The PBRF and the associated research assessment process are intended to stimulate research excellence within TEOs and an overall improvement in the relative international performance of the New Zealand research base. This may be achieved through changes in institutional structures as well as through individual work patterns. At the same time, any assessment system necessarily creates some administrative load and may have unintended or indirect effects. For example, research assessment may draw attention away from teaching. The need to respond to particular metrics may de-emphasise other desirable outputs from the research process. Researchers may change focus to unduly short-term and predictable goals thought to produce reliable assessment outcomes but which diverge from broader research and economic values.

What has been the effect of the PBRF on the New Zealand research base?

Are there particular strategic or management changes in TEOs that have occurred because of the PBRF?

How has the PBRF affected the management of research resources?

Is there specific evidence of improvement in the quality of New Zealand's research, or is it too early to make any judgment?

Do you identify any actual, or emerging, negative effects that the PBRF is having on the type of research goals being pursued or on other aspects of the tertiary education system?

Do you recognise some research, or types of research, as being inherently more risky than others? If so, do you perceive that the PBRF has had any effect on 'risky and innovative research'? (This concern relates specifically to Tertiary Education Strategy priority 4 "Improving research connections and linkages to create economic opportunities").

2. Consequences of the PBRF for research and researchers

This theme asks about differential effects that the PBRF might have on some kinds of research or some groups of researchers and about possible unintended consequences of the PBRF.

Research assessment does not necessarily work evenly across the research base, though it is intended that due account should be taken of any effects on particular areas.

Nonetheless, concerns arise that any use of metrics tends to work to the advantage of established researchers about whom more information is available. It is also widely felt that basic research in the natural sciences may be more attuned to formal assessment than either applied research or social sciences.

Do you feel that the PBRF has had any intended or unintended consequences on new and emerging researchers?

Have there been any intended or unintended consequences of the PBRF on research assessment on the humanities, on social sciences or on professional areas of research (for example, health)?

What have been the intended or unintended consequences for work with research users in the public and private sector or on engagement with the community?

Do you feel that the PBRF has had any intended or unintended consequences on the time researchers can spend on administration duties?

What consequences has the PBRF had for Māori researchers?

What consequences has the PBRF had for Pacific Peoples' researchers?

What other selective or differential effects of the PBRF have you observed?

In responding to these questions during the face-to-face interviews or focus groups it would be of great value if particular examples could be described to evidence the consequences, but general impressions of broad changes in the research base are also of interest.

3. Possible improvements to the PBRF system

This theme asks about the structure and implementation of the PBRF.

Extensive and detailed planning was used in developing and implementing the PBRF system, including widespread consultation with the research community. Changes have been made at different stages in response to feedback and experience. It is expected, however, that the PBRF system will continue to evolve in future assessment cycles. Alongside the structure of the assessment system, there may be issues which arise from its implementation. Improvement is constantly sought in making the system simple, transparent and a 'light-touch' on institutional and staff workloads.

During the face-to-face interviews or focus groups it would be helpful if you can comment on whether you are broadly content with or would suggest possible changes to the following:

Weightings for the three PBRF components (Quality Evaluation; research degree completions; and external research income).

Subject-area cost weightings (applied to the Quality Evaluation and research degree completions).

The individual as the unit of assessment (in other national systems the department or subject group may be the unit of assessment).

In regard to the processes and procedures for the 2006 Quality Evaluation, are you aware of any evidence about specific features that worked well or about problems arising from either the design of the quality evaluation or its implementation?

Can you suggest how these processes and procedures might be improved for the 2012 Quality Evaluation?

4. Other issues linked to the PBRF

It would be helpful if during the face-to-face interviews or focus groups you could let us know about any other issues that you feel should be considered in the context of this review.

The questions under each theme are intended to indicate known areas of policy interest and concern in the tertiary sector. They are not intended to be exclusive and you should feel able to comment on a wider range of issues if they appear relevant.

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This bibliography is intended as a resource for future study of the PBRF. It is an extended list of background literature as well as a record of text references.

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Annex 8. Glossary

AQS Average Quality Score derived from the assessment of the components of the EP submitted by researchers within the PBRF

ARISE: Advanced Research in Science and Engineering, a recent study by the American Association for the Arts and Science subtitled “Investing in Early-Career Scientists and High-Risk, High-Reward Research”.

Assessment period for PBRF 2006 was the period between 1 January 2000 and 31 December 2005. Only ROs produced in this period were eligible for inclusion in EPs for the 2006 Quality Evaluation.

AUS Association of University Staff is the union representing the industrial and professional interests of over 6,500 staff employed in universities across New Zealand.

BERD Business enterprise expenditure on R&D is the total R&D performed in the business sector. Contrast with BE-GERD, which is that part of GERD funded by the business enterprise sector.

Bibliometrics are measures of research activity and performance derived from databases of journal articles and of citations of those articles. There are associated secondary measures based on relative journal and article citation rates.

Census date 14 June 2006 (see also PBRF Census)

Citations are the formal references made in a journal paper or other publication to earlier work. These citations (or cites) usually indicate that the earlier work supports the publication’s methods, data or claims in some way. Negative citations may also occur.

Component scores The scores from 0-7 that are assigned to each of the three components of an EP (i.e. RO, PE and CRE).

CoREs Centres of Research Excellence are inter-institutional research networks where researchers work together on a commonly agreed work programme. The CoRE Fund was set up in 2001 to encourage development of excellent and strategically focused research. It encourages the tertiary education sector to develop and strengthen research with other research organisations, enterprises and the communities that they serve.

CRE Contribution to the Research Environment is the contribution that a PBRF-eligible staff member has made to the general furtherance of research in his/her TEO or in the broader sphere of his/her subject area. It is one of the three main components of an EP. A contribution to the research environment type is one of the defined categories for listing examples of contribution to the research environment in an EP. Examples of contribution to the research environment types include membership of research collaborations and consortia and supervision of student research.

CRI Crown Research Institutes In 1992, as part of reforms to the NZ science sector, the CRIs were established as limited liability companies under and subject to the Companies Act. Until then, government departments (principally the Department of Scientific and Industrial Research) undertook the activities that are now carried out by the CRIs. Each CRI is also subject to the CE Act and the CRI Act. These Acts address the ownership, governance and public accountability arrangements for CRIs.

EFTS Equivalent full-time students

EP Evidence Portfolio is the collection of information on the ROs, PE, and CRE of a PBRF-eligible staff member during the assessment period that is reviewed by a peer review panel and assigned to a Quality Category.

ERI External Research Income is income for research purposes gained by a TEO from external sources. ERI is one of the three elements in the PBRF funding formula, along with the QE and RDC.

EU-15 refers to the number of member countries in the European Union prior to the accession of ten further candidate countries on 1 May 2004. The EU-15 comprised the following countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, and the United Kingdom.

Excellence in the context of this report is not just about the production of high-quality research articles, books and other forms of research output. It also includes all of the following: the production and creation of leading-edge knowledge; the application of that knowledge; the dissemination of that knowledge to students and the wider community, and supporting current and potential researchers (eg. postgraduate students) in the creation, application and dissemination of knowledge.

Formative see Summative

Frascati The Frascati Manual was first published as the outcome of an OECD meeting in June 1963 with national experts on R&D statistics at the Villa Falcioneri in Frascati, Italy. The result was the first official version of the Proposed Standard Practice for Surveys of Research and Development, now commonly known as the Frascati Manual. The Working Party of National Experts on Science and Technology Indicators (NESTI) has now developed a "Frascati Family" of methodological manuals, including publications on innovation (Oslo Manual), human resources (Canberra Manual) and the technological balance of payments and patents.

FRST The Foundation for Research, Science and Technology is a Crown entity governed by a Board appointed by the New Zealand Minister of Research, Science and Technology.

FTE Full-time-equivalent staff

Funded Quality Category A Quality Category that attracts PBRF funding (i.e. an "A", "B", "C", or "C(NE)" Quality Category).

GDP Gross Domestic Product

GERD Gross Expenditure on R&D

Group of Eight represents Australia's leading universities. It began operating as an informal network of vice-chancellors in 1994 and was formally incorporated in September 1999. The Group works to ensure a consistent and sustainable policy environment which maximizes the wide-ranging economic, social and cultural benefits to the Australian community of higher education and which ensures Australian universities are recognized as among the best in the world. Membership of the group consists of the vice-chancellors/presidents of: Australian National University, Monash University, the universities of Adelaide, Melbourne, New South Wales, Queensland, Sydney and Western Australia. The Group aims to: enhance the contribution of Australia's universities to the nation's social, economic, cultural and environmental well-being and prosperity; extend the contribution of Australia's universities to the generation and preservation of the world's stock of knowledge; strengthen Australia's capacity to engage in and benefit from global developments; and expand opportunities for Australian students, regardless of background, to participate in world class higher education.

Guidelines The Guidelines for the 2006 PBRF cycle (see Bibliography)

HEFCE The Higher Education Funding Council for England distributes public money to universities and colleges in England that provide higher education. HEFCE was set up

by the Government in 1992 as a 'non-departmental public body', i.e. it works within a policy framework set by the Secretary of State for Innovation, Universities and Skills, but is not part of the Department for Innovation, Universities and Skills – DIUS (formerly the Department for Education and Skills – DfES).

HESA The Higher Education Statistics Agency is the official agency for the collection, analysis and dissemination of quantitative information about higher education in the UK. It was set up by agreement between the relevant UK government departments, higher education funding councils and the universities and colleges in 1993, following the White Paper “Higher Education: a new framework”, which called for more coherence in HE statistics, and the 1992 Higher and Further Education Acts, which established an integrated higher education system throughout the United Kingdom.

HoD Head of Department

ICT Information and Communications Technology

Impact is the effect or outcome of a piece of research which may be seen in the context of the research field or the wider economy. In bibliometrics, it is the average citation rate of the outputs for a specified source (country, organisation, author). This is a simple and direct measure of research performance since citations usually reflect acknowledgement by later authors of the value of a published item. The impact figure can be taken as a local measure of the 'worth' of publications. Impact figures can be rebased to take account of the world average figure in the field. In this way, comparisons can be made between fields that have different raw impact values to judge their effectiveness.

Indicative Quality Category is compiled from the preliminary scores assigned by the Panel Pair at the end of the pre-meeting assessment.

IP Intellectual Property

ITPs Institutes of Technology and Polytechnics

ITPQ is the operational committee established by the Institutes of Technology and Polytechnics. ITPQ is responsible for academic quality assurance within the polytechnic sector under delegated authority from the New Zealand Qualifications Authority (NZQA).

Kaupapa Māori research based on Māori epistemology and pedagogy that supports the survival of Māori knowledge (mātauranga), language (te reo) and custom (tikanga).

Marsden Fund was established by the NZ Government in 1994 to support excellent ideas-driven research initiated by researchers themselves. The Fund takes its name from Sir Ernest Marsden, the founding secretary of the Department of Scientific and Industrial Research (DSIR). In December 1995, the administration of the Marsden Fund passed to the Royal Society of New Zealand. The portfolio originally covered natural and physical sciences, as well as social sciences. But in 1997, the NZ Government increased the Fund's value and scope, adding the humanities to the Marsden remit.

Mātauranga Māori Knowledge based on traditional Māori concepts, traditional activities and understandings passed down through each generation. Overtime generations have added to these understandings. Mātauranga Māori provides an opportunity to understand the actions, activities etc of the past, why things are in the present, and to provide a base for future thinking, perhaps strategies, in relation to progressing Māori in tertiary study, contributing to the survival of Māori as a people.

MKD Māori Knowledge and Development Panel One of the 12 peer review panels of the PBRF.

MoE (New Zealand) Ministry of Education Te Tāhuhu o te Mātauranga

Moderation Panel/Moderators The function of moderation is to ensure that standards are consistent across peer review panels and that the PBRF guidelines are properly adhered to. For the 2006 Quality Evaluation, there was a Principal Moderator and two Deputy Moderators.

MoRST The Ministry of Research, Science and Technology Te Manatū Pūtaiao is a New Zealand government department which develops research and innovation policies. MoRST manages the publicly funded part of the RS&T system on behalf of the Government.

NE researchers New and emerging researchers

NAU Nominated academic units are groupings of staff as nominated by each TEO for the purposes of reporting aggregated results of the Quality Evaluation.

NROs Nominated research outputs are the (up to four) best research outputs that the PBRF-eligible staff member nominates in the RO component of her/his EP. NROs are given particular scrutiny during the Quality Evaluation process.

NZQA The New Zealand Qualifications Authority Mana Tohu Mātauranga O Aotearoa, quality-assures secondary and tertiary qualifications and education providers, evaluates overseas qualifications and administers the New Zealand Register of Quality Assured Qualifications and the National Qualifications Framework, including the NCEA.

NZVCC The New Zealand Vice-Chancellors' Committee was established by the Universities Act 1961 which replaced the federal University of New Zealand with separate institutions. Today the Committee represents the interests of New Zealand's eight universities: Auckland, Auckland University of Technology, Waikato, Massey, Victoria, Canterbury, Lincoln and Otago. The NZVCC secretariat is located in Wellington.

OECD The Organisation for Economic Co-operation and Development evolved in 1961 from the former Organisation for European Economic Co-operation which was formed to administer American and Canadian aid after World War II. It now has 30 member and 70 associate countries. Its members account for about two-thirds of global goods and services.

Other research outputs Research outputs (up to 30) additional to the four Nominated ROs that a PBRF-eligible staff member includes in the RO component of her/his EP.

Panel pair The two panel members who undertake the preparatory scoring of an EP before the panel meets.

“Partial” round The 2006 Quality Evaluation was a “partial” round in that Quality Categories assigned to EPs in the previous (2003) Quality Evaluation were “carried over” to the 2006 Quality Evaluation, with the only EPs submitted for assessment being first time EPs and those EPs that were to be assessed under a subject area with a higher cost-weighting than the subject area used for its assessment in 2003.

PBRF Performance-Based Research Fund.

PBRF2003 was the first full round of assessment.

PBRF2006 was the most recent round of assessment but was only a “partial” round.

PBRF2012 The next full round of the Quality Evaluation will take place in 2012.

PBRF-eligible staff member TEO staff member eligible to take part in the PBRF Quality Evaluation process.

PBRF Review Advisory Group The composition of the Advisory Group for this review includes representatives from key parts of the sector; an external evaluation adviser; and representatives from the TEC and MoE. The review is advised and guided by the

PBRF Review Advisory Group with the project sponsor having overall governance responsibility. The composition of the Advisory Group for this review includes representatives from key parts of the sector; an external evaluation adviser; and representatives from the TEC and MoE.

PDRA Postdoctoral research assistant

Peer Review Panels Groups of experts who evaluate the quality of research as set out in individual EPs. There are 12 panels, and the range of subject areas under each panel is identified (there are 42 subject areas). The diversity of panels is small compared to, for example, the UK system, which has 68 panels.

PE Peer esteem Esteem with which a PBRF-eligible staff member is viewed by fellow researchers. It is one of the three main components of an EP. A PE type is one of the defined categories for listing examples of PE in an EP. Examples of PE types include conference addresses and favourable reviews.

PGRs Postgraduate researchers

PIs, Principal Investigators are the permanent academic staff named on research grants and contracts as directors of projects.

Points/points scale The first stage in the assessment of an EP is based on allocating points on a scale of 1 (lowest) to 7 (highest) to each of the three components of an EP.

Polytechnic A TEO that is characterised by a wide diversity of vocational and professional programmes. It includes an institution established as a polytechnic, institute of technology, technical institute or community college under the Education Act 1964.

Preliminary scores The “final” pre-meeting scores assigned to an EP by the Panel Pairs (working together). These scores are used to compile an Indicative Quality Category for the EP.

Preparatory score The initial pre-meeting scores assigned to an EP by each member of the Panel Pairs (working independently).

Primary field of research The research field of a staff member’s research activity during the assessment period, and especially that of the (up to) four NROs selected for their EP.

PTE Private Training Establishment A privately owned education organisation, registered with the NZQA, that provides education, training or assessment services.

Quality-assured research output Research output that has been subject to a formal process of quality assurance.

Quality Category A rating of researcher excellence to which PBRF-eligible staff are assigned following the Quality Evaluation process. There are six categories — “A”, “B”, “C”, “C(NE)”, “R”, and “R(NE)”. Category “A” signifies researcher excellence at the highest level, and category “R” represents research activity/quality at a level which is insufficient for recognition by the PBRF. “(NE)” signals a Quality Category specific to new and emerging researchers (NEs). NEs may be assigned a variant category C(NE) or R(NE), where C(NE) requires slightly less stringent criteria than for other staff. NEs meeting A and B criteria are not distinguished from other staff.

QE Quality Evaluation The component of the PBRF that assesses the quality of research outputs produced by PBRF-eligible staff, the esteem within which they are regarded for their research activity, and their contribution to the research environment. The Quality Evaluation is one of the three measures of the PBRF, along with the Research Degree Completions (RDCs) measure and the External Research Income (ERI) measure.

Quality grade refers to the quality categories A, B, C, C(NE), R or R(NE)

Quality score A standard measure of research quality. It is calculated by adding the weighted Quality Categories (i.e. “A” [10], “B” [6], “C” [2], “C[NE]” [2], “R” [0], and “R[NE]” [0]) of a PBRF-eligible staff in a particular unit (such as a TEO, nominated academic unit, or subject area) and dividing by the number of staff in that unit, either on a headcount or FTE basis.

RAE Research Assessment Exercise is the cyclical process by which research in UK universities is assessed in order to create funding metrics.

RDCs Research degree completions measure the number of research-based postgraduate degrees completed within a TEO where there is a research component of 0.75 EFTS or more. It is one of the three components of the PBRF, along with the QE and ERI.

RMI Research management information (systems)

RO Research output Product of research that is evaluated during the Quality Evaluation process. It is one of the three components of an EP.

RS&T Research, Science and Technology

RTU, RTUs Research top ups were added to institutional grants prior to the PBRF to create a research-related component, but were changed as they related to quantity rather than quality.

Secondary data These are data held by the TEC and the MoE and are EPs, the PBRF censuses, and the single data return (SDR). A schedule of research reports is currently being developed.

SDR Single Data Return The SDR is the main source of information for the Student Component tertiary funding system. It forms the basis of the calculation of Student Component funding for individual TEOs. The SDR also provides the base data for compilation and analysis of tertiary education statistics on learner enrolments, and qualification completions and retentions. This information is used for reporting and monitoring purposes. Research completions data is used in relation to the PBRF.

Specialist adviser Expert in a particular subject area used to assist a peer review panel to evaluate a particular EP.

SRG Sector Reference Group

Subject area An area of research activity. For the purposes of PBRF2006, research activity was classified into 42 subject areas each of which embodies a recognised academic discipline or disciplines.

Summative/Formative In the terminology of this report, summative is used to refer to aggregate quantitative results for scores and then reputations. Formative is used to refer to behavioural outcomes for researchers and institutions. Note that ‘formative and summative’ are also used to describe evaluation processes, which is why they suggest themselves here in a parallel context. This is unlikely to confuse the informed reader, but is a point about which they should be aware.

Te Kahui Amokura is the Māori Committee of the NZVCC, the Standing Committee on Māori, and provides advice to the NZVCC and universities on strategies, policies and structures that relate to Māori and universities in order to promote strategic Māori leadership and academic advancement for Māori students and staff within the New Zealand university system, collegial support for senior Māori management in universities, and a co-operative approach to Māori academic advancement within the university system.

Te reo Māori language

TEAC was the former Tertiary Education Advisory Commission

TEC is the Tertiary Education Commission Te Amorangi Mātauranga Matua

TEOs are Tertiary Education Organisations which include universities, polytechnics, further education colleges, wānanga, Bible colleges and PTEs.

Tie-points The quality standards expected for scores 2, 4 and 6 in each of the three components of an EP.

Tikanga Māori is recognised Māori custom, which might be termed policy

UoA, Unit of Assessment is used in a New Zealand context to define the unit of staff that will be assessed (the individual rather than the group in the present system). In the UK it is used to define the subject granularity at which a group will be assessed.

Wānanga is a type of publicly-owned TEO that provides education in a Māori cultural context, delivering education, training, and research that advances and disseminates knowledge, develops intellectual independence, and assists the application of knowledge about ahuatanga Māori (Māori tradition) according to tikanga Māori (Māori custom). According to legal definitions (reaffirmed by the Waitangi Tribunal in 2005), wānanga are similar in many ways to mainstream universities. Currently, wānanga offer certificates, Diplomas, and Bachelor degrees, and some provide programmes in specialized areas through the Doctoral level. Wānanga educational programmes are accredited through the NZQA and MoE, and are partly governed by the TEC. In traditional times wānanga conveyed meanings related to highly evolved knowledge, lore, occult arts, and also 'forum' in the sense of a discussion to arrive at deeper understanding.