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Economics Policy Strategy

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## ACIL Tasman Briefing Note to ERA

Date: 12 November 2007

Subject: Practical issues in central procurement model

### Key points

- *Responsibility for least cost maintenance of system reliability and security over time – clearly separated from Water Corporation and with costs inclusive of user and environmental as well as supplier costs.*
- *There would be significant scope for delegation of some operational aspects of the function to Water Corporation, if its current distribution and retail activities remain largely as they are – but this may still involve some compromise on other potentially valuable Water Corporation functions, including as a check on possible market abuse in a thin market.*
- *The entity will need a reasonably deep involvement in the model development and in the systematic modelling of whole of system implications of alternative procurement and operational strategies. These probably cannot be delegated, and the duplication concerns might best be addressed through some form of joint venturing with Water Corporation, recognising that the two bodies have different needs from the common activities. This suggests a fairly hands on function for the entity through to the point of securing the call options.*
- *Actual exercising of call options and project commissioning could sometimes be delegated to Water Corporation as part of formal review of operational planning – with the entity concerned that the planning is consistent with its function of minimising system costs within reliability constraints and needing to set trigger rules that protect these interests.*
- *The portfolio of call options is likely to include a mix of readiness options with limited up-front commitment and high exercise costs, committed capacity with somewhat lower exercise costs and DM measures. The entity will need the capability to assess the value to the portfolio of proposed new and expiring call options (or at least to assess whether this value is positive or not) – and this concept of value should define option value.*
- *It is not necessarily the case that the procurement entity will need to commission and fully fund new projects. The proposed options approach could allow for market offerings in which project proponents are prepared to accept some dispatch risk in return for possible access to dispatch upside. A flexible range of ways of commissioning safe supply could be considered – possibly involving a mix of ownership, volume pricing and operating flexibility.*

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## Purpose

The purpose of this note is to summarise some of the thinking going into a further section in our paper discussing a framework for moving to a central procurement model, with this function possibly being separated from Water Corporation. The additional section is concerned with practical issues that will need to be addressed in moving to implementation and operation. Important considerations in practical and effective implementation include:

- The proposed objectives and role of the entity
- Proposed form of the entity
  - Including establishment issues
- The key functions undertaken
  - Procurement planning
    - … involving the planning and holding of call options
  - Procurement of capacity as required
    - … involving the triggering of call options
  - Dispatch of capacity into supply
  - Including how these functions would relate to the functions of other bodies such as Water Corporation, Department of Water and ERA
- Governance arrangements

## Proposed role and objectives

The objectives and role of the procurement entity would need to be established and legislated. The over-arching objective of the entity would be to achieve least cost balancing of water supply and demand. We propose that this be interpreted as least expected cost (supplier, user and the wider community and environment, weighted over plausible demand and rainfall scenarios) within agreed security and reliability standards.

If this is the case, the entity would sensibly be a key advisor on important aspects of policy, particularly in relation to key trade-offs across different values (including commercial vs environmental). Discharge of this role by Water Corporation could be interpreted as involving some conflict and some threat to competitive neutrality. The wider case for weighing the relative merits of separation against some serious practical benefits from retaining a Water Corporation role were discussed in our earlier comments on the NERA paper and will be drawn more fully into the next version of this framework paper.

We see the entity as necessarily having a reasonably strong role in determining procurement policy and in auditing the balance between procurement and operation strategy in best meeting overall system needs. In term of practical conversion of this into an operational function, negotiating and securing options and then triggering these options, there is probably more room for flexibility, with possible delegation to Water Corporation as long as a significant oversight function is retained. We doubt that the responsibilities in relation to the establishment, maintenance and provision of access to the options modelling capability could sensibly be left with Water Corporation – but there could be real advantages in some form of ‘joint venture’ in respect of procurement and operational modelling.



However, we lean towards clean separation from Water Corporation of formal responsibility for strategy up to and including the establishment and maintenance of the portfolio of call options over supplies and DM – while being more relaxed about Water Corporation incorporating the *exercise of options under agreed trigger rules* into its operational strategy, provided that operational strategy is subject to review/audit by the proposed entity<sup>1</sup>. However, this delegation would bring with it constraints on Water Corporation's ability to compete into the supply market – a role that might otherwise be possible and potentially valuable.

Of course, were ERA to recommend in favour of some wider form of restructuring of distribution and retail activities then this could have significant implications for the practical options for delegation. Where the rationale for holding and/or exercising options lies in the value of the extra supply potential to multiple retail suppliers, it is likely to be harder to delegate the functions.

## Proposed form of entity

The entity would probably best be a statutory body, established with its own governing body. The procedures for appointing the governing body would need to be established, including the appointment of the chair.

Funding of the entity could be either through allocation of state government consolidated revenue or through fees levied on market participants. Under that latter, it would be necessary to define who would be responsible for paying fees and how total fees are to be allocated between them. The functions are needed to meet demand for consumptive supplies, so that our inclination would be strongly in favour of the costs being largely if not fully sheeted back to users. In effect this would flow from an 'impacter pays' philosophy of equity, but it may also be relevant to ensuring reasonable sound price incentives.

One possible option would be to combine the water planning and procurement entity with WA's electricity Independent Market Operator (IMO) of the wholesale electricity market.

It is important to recognise that the function envisaged – at least after the basic investment in modelling and other capability has been undertaken – is not likely to be an intensive one *most of the time*. If the second desalination plant proceeds, it could be a long time before a lot of attention needs to be paid to IWSS procurement strategy. There will be a need for ongoing review of the adequacy of options in place and the lead times of possibilities for future supply relative to possible needs – but actual contracting activities are likely to be relatively rare. Resourcing would need to be organised with this in mind.

## Key functions

The key functions to be undertaken are discussed under the headings:

- Procurement planning
- Procurement of new source capacity as required
- Ensuring the balancing of supply and demand given existing (and forthcoming) capacity

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<sup>1</sup> The function of the review/audit would be to confirm compatibility with the objective of minimising expected costs – and not just Water Corporation or supplier costs – over the joint procurement and operational strategy.



In practice, however, they are closely inter-related.

Whether these functions would be undertaken by the procurement entity or delegated to other parties subject to supervision by the entity would depend on the specific decisions on these matters, within the above guidelines.

Within each of these functions, the entity would have particular responsibilities for the release of information to participants.

The following three sub-sections consider what would be involved for the entity to undertake these key functions itself. A final sub-section discusses what would be involved were the entity to assume a supervisory role rather than be responsible directly for these functions.

## **Procurement planning**

A key function of the entity will be to ensure that the water supply system is able to match supply and demand at all times and as cost effectively as possible.

This planning function necessarily operates within a range of government policy frameworks. These include:

- Definition of reliable supply
  - Given the stochastic nature of supply, and uncertainty of the impact of climate change and current drought conditions, the acceptable reliability of supply needs to be determined by Government as a policy setting.
  - Currently this is specified in terms of an acceptable level of risk regarding the imposition of water restrictions.
  - It would seem preferable to progress to a more flexible approach that factors in increasing understanding of the true costs of restrictions – or, in the longer term, that addresses reliability through pricing mechanisms
- Definition of environmental requirements, including constraints on aquifer abstractions.
  - We see the regulation function in respect of the environment continuing to be discharged by an appropriate regulatory agency, not by the procurement entity. However, the proposed approach to procurement should support much better information being available on the true cost of particular forms of environmental regulation. The entity could and should (because of its command over the system cost modelling) have a key function to advise these regulatory processes of the cost of regulatory constraints and to assist in identifying potentially lower cost regulatory strategies that meet the regulatory objectives.

The planning framework would involve a real options adaptive approach, which recognises the risks and likelihoods of alternative climate and inflow outcomes. Accordingly, the entity would need to draw upon climate and hydrological expertise, and ensure that future forecasts of supply from existing and prospective sources and expectations of risks are updated as new information and assessments become available.

The entity would be responsible for ensuring that the combination of existing sources and future options for new sources/demand management will be sufficient to match future demand in all periods. As discussed in our earlier procurement paper, this requires the assembly of a portfolio of call options to sit alongside existing sources. These call options are “readiness options” which



can be commissioned in a relatively short period and firm supply options that provide flexibility for faster response. They may involve some up-front cost in order to be available as a call option – with a further cost involved in exercising the option (ie commissioning the source or operating and supplying water from an established source).

Maintaining and updating such a portfolio of call options will involve:

- Developing portfolio and real options modelling capability
  - Including the ability to assess limiting ‘gaps’ in the available portfolio, to value the incremental contribution of new possibilities to the portfolio and to value the drop in portfolio value from not maintaining any options that are coming up for review.
- Forecasting of future demand for water
  - Including how demand might vary under alternative climate and development scenarios
  - Allowing for the impact of alternative demand management and/or restriction regimes, recognising that the entity is likely to be able to influence these.
- Calling for bids from potential suppliers to provide new call options.
  - The options will include the potential supply from any of a wide range of potential new sources, involving varying lead times and capital expenditures.
- Assessing the optimal portfolio of call options/existing supplies/demand management programs
  - Under most likely demand and inflow conditions
  - Taking account of system operation considerations, including the potential to operate existing sources flexibly, and the ability to run some sources hard to improve dam storage capacity and/or restore aquifer levels etc
  - Probing and adapting the portfolio to ensure that it can be adapted to meet the most adverse conditions (albeit at a higher cost)
  - Identifying the least expected cost portfolio of options/existing supplies/demand management programs.
- Purchasing call options as required.
  - Purchase of the call option, as distinct from the purchase of capacity, will involve covering the expenditures required to progress the option through investigations and approvals, so that either supply or capacity can be commissioned at short notice.
  - Ideally several call options will be offered by potential suppliers for a given potential source, with the entity assessing the alternatives in terms of cost, lead times, risk and general fit within the portfolio.
  - For demand management options this may involve liaison with Government and Water Corporation. DM strategies that might best be delivered via Water Corporation or the wider set of retailers would probably best be formally funded via the procurement entity.
- Continuously up-dating the portfolio modelling and assessment in the light of new information.

In requesting bids to provide new call options, the entity will wish to make available as much information as possible about the supply/demand position and currently assessed portfolio. This is likely to involve the release of modelling tools and data, including hydrological forecasts and uncertainties, and the approach taken to robust planning and procurement strategy, given the difficulties in providing a precise characterisation of the uncertainties.



In all of these activities, the entity will liaise closely with Water Corporation. This can be expected to involve some duplication of effort, but the extent could be minimised through sound joint activities in this area. As was flagged earlier, some form of joint venturing in model development and maintenance and forecasting could limit the duplication while allowing the legitimate differences in objectives of the two bodies to be retained – with incentives to scrutinise the joint activities for appropriateness to both sets. This seems likely to be preferable to direct delegation of these activities to Water Corporation.

We would be comfortable about secondary trading of options, provided that the entity is able to protect its primary concern for the options being deliverable – and we expect this to involve a firm grounding of the options in a delivery strategy that has been secured and that has been scrutinised by the entity.

### **Procuring new sources**

Given continued growth in demand, the maintenance of a portfolio of actual sources and readiness options can be expected to require the triggering of call options – ie contracting for supply or the conversion of some long-lead time call options into shorter lead time options through commitment to building new supply infrastructure. Thus the procurement entity is likely to be formally responsible for commissioning new capacity if such commissioned is deemed to be cost effective.

However, it may not in fact need at any point to formally commission the construction of the new infrastructure – in the sense of committing to a contract determined to cover construction costs. The market may well be willing to accept some dispatch risk depending on the approach taken to specifying the pricing that would apply to dispatch and the conditions under which dispatch might be expected. Consider two ‘competing’ offers to meet a demand for increased security:

- The first offer is to build and transfer a desalination plant to the entity, with the proponent expecting to more than recover construction costs through the contract price, but not looking to accept any dispatch risk.
- The second offer is to build and operate a desalination plant on the basis of a contract which underwrites, say, 60 per cent of the capital costs; and locks the procurement agency into accepting 40 per cent of the potential production from the new plant on a take or pay contract, priced at marginal cost of operation plus 25%; and offers the procurement agency flexibility to determine the level of production using the remaining 60 per cent of capacity through either an agreed volume charge of marginal cost of production plus 50 per cent (essentially a cap contract for the surplus capacity) or where the agency accepts the spot market risk.

Comparing these options would require careful analysis and the right answer will depend on the probabilistic assumptions used by the entity. The first looks a lot like a traditional project procurement. The latter is, in a much more fundamental sense, a supply call option strategy. The projects differ in the level of up-front cost commitment being sought, in the level of supply flexibility and in the marginal cost faced for additional water. Peaking power stations tend to be constructed more under the latter model than the former.

In this sense, contracts that trigger a decision to build new infrastructure – whether by the entity or by a market supplier needing to hedge dispatch risks – should still be seen as one form of call



option, with the primary service being sought being water and water security services, not physical infrastructure. The infrastructure is a physical hedge; with longer lead times, the design of a plant along with necessary approvals may offer a sufficient hedge for a supply contract. A point can be reached where the cost effective way to ensure system security involves committing to construction, and typically such a commitment (by either the entity or a market participant) would lower the level of demand for other longer term readiness options. The commitment to actual operation (for example, actively running a desalination plant) then becomes the relevant decision from the point of view of exercise of the options embodied in the new capacity.

This implies that it could be the procurement entity that will be formally responsible for what is currently a major part of Water Corporation's capital programme – for actively commissioning new construction – though the level of such direct contracting may fall. (It also implies that the entity, rather than Water Corporation, would be required to finance the procurement program). As Water Corporation has pointed out, this could require the entity to have the appropriate expertise to manage a significant procurement programme. It certainly requires the capacity to assess and compare complex proposals with quite different output structures; allowing for the widest range of proposals would require the ability to follow through with formal capacity commissioning, should this emerge as part of the most cost effective portfolio. Given that the responsibilities of the electricity IMO includes procurement of capacity if required, an entity that combined water and energy might be appropriate.

The extent to which that new capacity is actually utilised would depend on the assessment of which sources provided the least cost dispatch (taking into account the opportunity cost of the water supplied). This is discussed below.

Provided that there is reasonable competition in proposing options as inclusions in the portfolio, it should be possible to procure the options for a cost approximating the incremental costs of supply. It is possible, however, that the relative thinness of the market, and possible lumpiness of some of the possibilities, could limit the depth of competition and the procurement entity would need to explore ways of checking the exploitation of market power. Possibilities include:

- Use of the system modelling capability to explore for packages that appear likely to be competitive – with scope for exercising or threatening to exercise the right to go back to market should the offer price be considered excessive.
- Possible scope for approaching Water Corporation as a provider, mirroring the role Water Corporation sees itself currently providing in ensuring supply where a project appears not to be commercially attractive. This could be interpreted as including a situation where one supply is able and determined to exercise excessive market power.

New supplies which are dispatched into the system would be contracted to Water Corporation and/or other distributors/retailers for supply to final customers. This will involve the setting up of appropriate contracts.

Alternatively, there *may* be scope for delegation of these responsibilities through to Water Corporation, under a framework in which the procurement entity retains responsibility for the triggering rules. Depending on the form of the triggers, this could allow for complete delegation of responsibility to Water Corporation within an agreed operational strategy for a defined period of time (in which it is agreed that Water Corporation could proceed to contracting should certain triggers – such as capacity levels – be met). Alternatively, and probably preferably, Water



Corporation would assume, through an agreed operational strategy, responsibility for advising the entity of an emerging trigger, and obtaining formal permission to proceed to contract.

As was flagged earlier, unless these triggering arrangements are very tightly defined, we would see difficulties in both delegating responsibility to Water Corporation and allowing Water Corporation to compete, either in bidding options or supply projects into the system, or via decisions it can control as to operating strategy, given the likelihood of some substitutability between operation and new supply.

## **Dispatch**

As well as maintaining the portfolio of future supply options, the entity would also be responsible for maintaining the supply/demand balance over the short term. This would involve defining how current demand is to be met from the operation of existing sources and new supplies that are due to be commissioned in the short term.

Water Corporation suggested that this might be best undertaken at the end of winter, when dam levels and groundwater availability for the forthcoming year are determined.

Least cost dispatch would examine the supply options from existing sources, sources due to come on stream as well other options available within the time frame – such as demand management.

We believe that least cost dispatch modelling would in fact be closely integrated with the portfolio planning modelling described above. This is necessary due to the inter-relatedness of the operating decisions on storage levels, reliability of supply and hence the need for procurement of new supplies/options.

For example, dispatch from the current system has significant implications for the portfolio of future supply options. It could be used to defer irreversible commitment to new supply capacity and it has the effect of extinguishing shorter term call options for supply. Dispatch from water factories generally entails higher up-front costs, but a lesser impact on future supply options. These types of decisions need to be made within the total options portfolio setting, if serious bias – towards unnecessary costs – is to be avoided.

As has been flagged earlier, we suspect that the system operators should have responsibility for development of the operational plans, but with a formal responsibility for having the plans audited and signed off by the procurement entity – possibly with a mechanism for dispute resolution should agreement not be possible. Water Corporation cannot assume full control because of the scope for shifting costs to both the procurement process and to users. (Costs shifted to the procurement process should trace back in the cost of water and security services to Water Corporation. The same feedback would not exist for user costs, but these user costs are a formal responsibility of the procurement entity via its responsibility to ensure least system cost, inclusive of user costs).

## **Entity as supervisory body**

Alternatively the procurement entity might be given a more limited, supervisory, role. This would involve Water Corporation continuing to do the detailed modelling, forecasting and





planning tasks, for procurement and system operation as described above, but formally under a delegation from the entity. The procurement entity would have the authority to:

- scrutinise Water Corporation's approach to these functions
- approve the call options to be incorporated into the portfolio, and
- approve the exercise of options, including but not necessarily via source commissioning.

The entity would want to develop familiarity with the portfolio option planning tools that would be necessary, and to understand and scrutinise the data and assumptions underpinning Water Corporation's analysis. The entity would continue to have responsibility to ensure that models and data were made available to potential suppliers.

The entity would also have the responsibility for supervising Water Corporation's request for offers for supply options, and ensure that there is a level playing field for tenderers.

The entity will have a particular responsibility to ensure that Water Corporation's modelling of the trade-offs between existing and new sources (in terms of contribution to the portfolio of options) is conducted robustly, and provides for the least expected cost solution. With such supervision, potential suppliers would have confidence that Water Corporation was not favouring existing supplies over new supplies in its dispatch and procurement decisions and was not inefficiently shifting costs.

While the entity would have the authority to approve Water Corporation's proposed contractual arrangements regarding options and commission of sources, it would be Water Corporation that contracted for new capacity. Similarly, although the entity would approve the dispatch arrangements from new and existing sources, Water Corporation would be the body contracting for actual supplies from new sources.

In practice, the effective discharge of these responsibilities will require detailed involvement in the modelling and planning systems. There is a risk therefore that the delegation arrangement would not offer enough cost savings to offset the governance/perverse incentive concerns that could accompany it.

## **Option valuation**

Within the proposed framework, an option is worth the reduction its availability can deliver to the expected forward costs, including exercise and operational costs, of the procurement portfolio. The proposed modelling capability should allow direct estimation of this value. This is explicitly a portfolio-based value concept, and it relies on the incremental value, inclusive of the costs avoided from alternative sourcing arrangements. In extreme circumstances, an option with a short lead time may have additional value via the way that it can ensure system security and reliability where this may not otherwise be achievable. This would beg the question of the value of the security, were it not for the recommendation that the entity be subject to the constraint of requiring the system security to be protected at all times, within an agreed definition.

Note that the key requirement is not knowledge of the value of an option but rather whether the value is positive or not – whether the portfolio is more cost effective with the option in or out. Where the value is positive, then the actual incremental value of the portfolio sets an upper bound on justifiable willingness to pay to acquire or maintain the option.



The earlier comments regarding market thinness and power are relevant here.

### **Governance arrangements**

These have been discussed in the paper already. Again, we see a crucial regulatory oversight function, probably via ERA, and the need for appropriate accountability and dispute resolution mechanisms.