

# TRADABLE SYSTEMS FOR WATER: BEST USE AND MAXIMISING VALUE

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## INTRODUCTION

My role in this session of the Conference is to comment upon the proposals in the New Zealand Business Council for Sustainable Development's (BCSD) report *Tradeable Rights for Commercial Water*. My co-speaker in this session, Peter Neilson, the Chief Executive of BCSD, has outlined the proposals, which BCSD refers to as the *Best Use Solutions Model*. I will provide a critique of this proposal by drawing upon the general ideas of economists around tradability and what I believe to be lessons that can be drawn from experiences in establishing markets for other commodities.

The scope of the use of markets for allocating resources, including for environmental objectives, has expanded considerably, especially in the last twenty-five years. New Zealand has shared in this trend. Markets have been developed in or for New Zealand for a number of derivatives – futures, options, swaps and forward rate agreements. Markets have also been developed for a number of financial instruments – the New Zealand dollar, government and corporate bonds and short-term money market instruments like bank bills. Decisions about which generators to run to produce electricity were formerly decided by a central agency but are now determined from the competitive offering of generators using the New Zealand Electricity Market (NZEM). There has been considerable work undertaken on the design of a market for balancing gas in the transmission pipelines in the North Island. The New Zealand

Emissions Trading Scheme (NZ-ETS), which was recently implemented, is a market mechanism to incentivise parties to reduce greenhouse gas emissions. Variation 5 of the Waikato Regional Plan is another market based mechanism. Its purpose is to incentivise parties to reduce nitrate discharges into the catchment of Lake Taupo. The allocation and transfer of the rights to use certain radio spectra and to catch fish have also been made market activities.

The trading of water rights for relocation is not new or novel. It is relatively common and well developed in some overseas jurisdictions, including Australia. Transfers within the same catchment (either upstream or downstream) or aquifer are catered for in section 136(2) the Resource Management Act 1991 (RMA) provided the transfer “is expressly allowed by a regional plan” or has been agreed to by the consent authority that granted the permit. There is at least one specialist broker for trading water rights active in New Zealand.

As the pressure on the supply of water in catchments and aquifers increases, however, so do the calls for increased tradability of water. The BCSD’s proposals are not the only call for this; nor are they the latest. The Land and Water Forum very recently released a comprehensive report entitled *A Fresh Start for Freshwater*. In this it called for water permits to be able to be transferred more easily. The Waikato Regional Council’s Variation 6 to its regional plan (Variation 6), which is currently before the Environment Court, includes proposals to allow the more ready tradability of surface water takes downstream. There were calls at the Hearings stage for these provisions to be made significantly more liberal than has been proposed.

What lessons for increasing the tradability of water can we draw from our recent experience in creating other markets?

## LESSONS FOR WATER TRADABILITY

### **Lesson 1: Markets and legal frameworks are complements**

*Markets require a solid legal foundation in order to be acceptable to participants as confidence in the practical enforceability of transactions is essential to the operation of every market.*

The New Zealand futures market began operation as a domestic market in 1985. For a couple of years previously greasy wool futures trading had occurred in New Zealand, but the contracts were registered and cleared in London under English law. New Zealand did not at this time have specific legislation relating to futures trading and the government was reluctant to provide any; in 1985 the government was heavily engaged in deregulating financial markets and not at all sympathetic to requests for introducing regulations to support a new market.

The London-based International Commodities Clearing House (ICCH), which was engaged by the promoters to provide the software and act as the clearing house for the market, was concerned that, in the absence of supporting legislation, futures related debts may be treated as gambling debts and be unenforceable. Whether its concerns were well-founded or not, ICCH was initially reluctant to clear New Zealand-domiciled contracts. Its concerns were overcome by the promoters of the exchange agreeing to all contracts being closed and settled every night and accepting a new contract in replacement at the current market price the next day. This, in the eyes of ICCH, capped its potential exposure to one day's movement in prices and it held from its clearing members initial deposits intended to cover this movement. From the point of view of New Zealand participants, there was limited practical effect, but without a satisfactory means to limit its risks relating to enforceability, the ICCH would not have proceeded and there would have been no futures market in New Zealand.

The New Zealand Electricity Market (NZEM) was also created without any specific legislation as the government made it very clear that it would not provide legislation to support the development of the market. This was despite its expectation that the parties involved would establish a market and that the State-Owned Enterprise Transpower would assist its creation.

In this case, the solution to enforceability was achieved by structuring NZEM as a multi-lateral contract. This solution had a number of consequences. It meant that participation in NZEM was voluntary and the market rules had to be agreed by the parties to the multi-lateral contract. It also led the parties to apply for authorization by the Commerce Commission because of concerns that the multi-lateral agreement could amount to “price fixing” under section 30 of the Commerce Act 1986 and so be not only illegal but also unenforceable. The parties that created NZEM went through complex multi-party negotiations and the trouble and expense of an authorisation hearing to ensure enforceability of transactions.

Market solutions to access to resources and legal frameworks to support access are complementary and not alternatives. The legal framework to support a market approach to determining allocation and exchange is different, however, to a legal framework to determine which parties will have access to resources and how much each will have. The former has to focus on the enforceability of agreements and not the criteria for determining access.

## **Lesson 2: Clarity about what is being traded**

*Clear definitions of what it is that is being traded are important for enforcement of transactions and hence for the willingness of parties to participate in trading.*

For a market to function well, buyers need to know what rights and obligations they acquire and sellers need to know their rights and obligations as well. What is being traded is usually not difficult to

determine in normal circumstances and often will seem a trivial issue; the buyer gets ownership of what they bought and in return is obliged to pay the seller and the seller has to deliver ownership to the buyer and in return will receive payment from the buyer. It is what happens in abnormal circumstances that usually requires time to develop and it is often these features that determine whether parties are willing to participate in the market.

The rights of sellers in the event of a payment default by a buyer were a particularly difficult issue to agree under the multi-lateral contract version of NZEM. As it is physically impossible to track which generators provide electrons to which buyers at any point in time, never mind over the course of a month, it is not possible to assign a default by a buyer to one or more generators or even to work out their proportionate shares of the default. In the end, it was decided to assume each generator participated in providing electricity to a defaulting buyer pro rata with their share of generation during the times the defaulting party consumed electricity. It was also decided that, in the first instance, the short fall in settlements received would be allocated to generators on this basis and be a deduction from the settlement funds they would receive; generators would be subjected to a pro rata “haircut” in the event of a payment default. This naturally led to the generators trying to impose high credit requirements on participants who buy electricity in NZEM.

Experience in several markets indicates that absolute certainty about the rights and obligations of buyers and sellers is not essential for an effective market to develop, provided the parties have sufficient information to be able to assess the likely outcomes if various contingencies arise and to factor the risks into their assessments of value. For example, the scaling of fish quota in the event of a change in the allowable catch has not stopped trading in fish quota. This is because the rules around determining the allowable catch are sufficiently clear that participants are able to form their own assessments of the risks and impact on the value of quota.

In this regard, fish quota trading is very instructive for the tradability of water rights. The chances that total allowable water takes may have to be adjusted in future as knowledge about the environment and the size of aquifers is refined seem very high. The lesson from markets elsewhere is that it would be helpful to tradability if the research base and criteria upon which such a decision would be based are set out in advance, together with how any alteration in the allowable water takes impacts on different categories of water permits.

### **Lesson 3: Tradability and highest value use**

*Irrespective of whether an asset or entitlement was obtained gratis as part of some publicly sanctioned allocation or paid for by the holder, if it is freely tradable every holder faces its highest use value when deciding whether to use or trade it, or leave it idle.*

The logic behind this is that instead of using the asset or entitlement, or leaving it idle and unused, the current owner can, if it is freely tradable, sell it to the party willing to pay the most for it because they value it most highly. In other words, the opportunity cost of using or leaving idle a resource is its value in its highest use by another party. For rational economic decision making about the use of a resource, the cost that matters is the opportunity cost not the original cost when the asset was acquired, or any other value.

A corollary of his point is that the argument sometimes raised against, for example, allocating emissions trading entitlements to firms facing international competition that this will not be as effective at encouraging emissions reductions is quite wrong. The implicit assumption behind the argument is that people value things on the basis of what they pay for them and not on the basis of what they can sell them for. This is not how a rational economic agent would behave. To them the value of something is what you could buy it for and/or the value of what you could sell it for; not what it originally cost them to purchase. People who inherit property they do not want

to retain generally want to sell it at its current market value and not give it away as the critics of gratis allocations effectively assume.

#### **Lesson 4: Tradability and allocative efficiency**

Economists recognise three forms of efficiency:

- Productive efficiency, or whether something is being produced at the lowest cost possible, given the technology available and the costs of inputs;
- Allocative efficiency, or whether available resources are being allocated so as to produce the highest value of goods and services possible, given the available technology; and
- Dynamic efficiency, or whether the right investments, including in new technology, are occurring at the optimal time.

Of these three forms of efficiency, regulators and economists usually consider that dynamic efficiency is more important to economic growth and improving economic welfare in the long run. This is because in the long run the appropriateness of investment decisions is more important to economic growth and welfare than whether resources are currently optimally allocated and costs minimised.

*If all you are concerned about is whether resources are being used to produce the most valuable outcome for society, i.e. if your only focus is allocative efficiency, the initial allocation of a resource does not matter, provided the resource is tradable and transactions costs are negligible and no party has market power in relation to the resource.*

The logic behind this is that if transactions costs are low (strictly speaking, they should be zero for the result to hold) and no party is able to exercise market power, so the market is competitive, the interaction of buyers and sellers will result over time in the resource moving to the parties who value it most highly, irrespective of the

initial allocation. This is the outcome necessary for allocative efficiency.

There are a number of corollaries of this proposition. Firstly, the question of the initial allocation of a resource has no long term bearing on the (allocative) efficiency of its use, provided there is “ready” tradability, i.e. provided there are low transactions costs and no party can exercise market power. As a result, you can effectively separate out decisions about initial allocation of say water rights, emission entitlements, fish quota, spectra allocation, etc. from concerns about efficient use, if there is ready tradability. The problem of initial allocation can be decided with different objectives in mind than ensuring the resource will end up being efficiently used.

Secondly, it is important for the allocative efficiency of outcomes to reduce or eliminate as much as practicable anything that raises transaction costs. This includes reducing where practicable the costs of: finding counter-parties; negotiating prices and terms; and enforcing transactions. In general, the fewer the restrictions on trading, the better; the wider the pool of potential participants, the better; and the more readily enforceable are rights, the better.

Thirdly, care needs to be taken to ensure that in any initial allocation no individual party, or group of parties, is able to exercise market power in relation to the resource or asset. A party with market power is able to restrict supply and raise prices above the value of their benefit to society at the margin. This is inconsistent with allocative efficiency.

New Zealand’s Commerce Act 1986 does not make having and exercising market power in itself an offence, nor does it make creating market power an offence, although it does control doing so by merger or acquisition. If market power is granted in an allocation of water rights there is little that can be done about it and the outcome is likely to be allocatively inefficient. Even in this situation, however, tradability may improve the efficiency of the allocation

compared with what it would be without trading because the party with market power still has to face the value of the resource to other potential users when making its own decisions.

I note that under Variation 6 it is proposed that Mighty River Power (MRP) be granted a near monopoly over water in the Waikato River above Lake Karapiro – certainly sufficient to grant it market power – and that there is no proposal that MRP’s water rights would be tradable. The outcome of this proposal is very likely to be allocatively inefficient, unless every drop of water in the upper Waikato is more valuable if used for hydro-generation than every other alternative use for the water that would be foreclosed by this decision.

Fourthly, “first-in, first-served” as a basis for initial allocation is not inconsistent with achieving allocative efficiency, or maximizing the value of a resource to the country, provided the rights granted under the regime are readily tradable.

## **Lesson 5: Initial allocations and wealth distribution**

*The terms and conditions of the initial allocation of a resource do matter for the distribution of wealth in the community. Expropriation of wealth or property rights can have very significant adverse effects on the willingness of parties to invest and hence on dynamic efficiency. Dynamic efficiency is the element of efficiency generally accepted to be the most important to promote in the long run, if economic growth and welfare are to be maximized.*

The party granted a right or entitlement is the party that has to be paid by others to sell or lease it and, depending on what it had to pay to apply for and acquire the right in the first instance, it will gain or lose from this transaction. So the initial distribution of rights influences the distribution of wealth in a community. This is fundamentally why the allocation of rights can be so contentious and tends to become very political, especially when the rights are valuable.

Economic historians have documented many instances where insecurity about the ownership of rights due to, for example, a past removal of rights without compensation has inhibited investment to exploit that right, and more generally from fear that if expropriation occurs in one instance it could occur in others. For a contemporary example one has to look no further than the economic malaise of Zimbabwe.

A consequence is that when a new legal regime relating to rights over resources is created, as often happens when a resource that was previously abundant has become relatively scarce through a growth in demand or the consequences of an adverse environmental effect previously unknown is discovered, it is important not to remove the rights of those that have them without adequate compensation. Care has to be taken, however, to ensure that in this process parties do not claim they possess greater rights than they actually have. The economic incentives on parties to do this are obvious. A right, for example, to use for hydro-generation the residual flow of a river after all other approved water takes have been extracted from it, is not a right to preclude others from having water takes approved.

There are several implications from the dynamic efficiency consequences of expropriation. Firstly, grand parenting existing rights avoids the negative impact on dynamic efficiency of other initial allocation regimes that involve some form of expropriation of existing rights. Provided the rights are readily tradable, grand parenting will not negatively affect allocative efficiency, except when it is widely expected that rights will be grand parented in future so that parties increase their use to increase their future entitlements. However, this problem can be overcome by making allocations on the basis of either historical usage from a period before when grand parenting was expected or a “best practice” measure of what efficient usage should have been, rather than what it actually was.

Secondly, if grand parenting leads to the allocation of more rights than it is thought appropriate for reasons such as the ongoing

environmental impact the level will create or the lack of capacity it leaves to provide for new entrants, using a tender to buy back rights will assist to produce an efficient outcome. Tendering to buy back rights will result in right holders who value the rights least highly reducing or eliminating their entitlement by selling them back. There will be no affect on those who value them more highly. A pro rata “haircut” of every party’s right will not discriminate between those who value them highly and those who don’t and so will tend to produce a less efficient outcome, initially. Provided the rights are readily tradable, however, even if the reduction is done by giving every party a “haircut” subsequent transfers among parties will re-establish an efficient allocation of the now reduced total allocation.

## **Lesson 6: Broaden the market improves outcomes**

*Broadening the diversity of the interests of potential participants in trading and increasing their number will tend to reduce search costs, increase the level of transactions and improve the efficiency of prices and resource outcomes achieved.*

There are several points to be made. Firstly, speculators can serve a useful economic function lubricating tradability and through this improving the allocative efficiency of outcomes. Rules that encourage participation in the market by as wide and diverse a group as possible will tend to improve the outcomes in terms of allocative efficiency.

Secondly, in the context of water permits, it makes sense to separate the right to take water from the right to use water in order to facilitate greater trading of water rights by opening up the market to parties that do not currently have a right to use the water.

Thirdly, artificial barriers to parties trading water, such as requiring that in order to buy a right to take water you already have to have a right to use water, should be avoided.

Finally, providing separate allocations for different uses of water and not allowing some trading among the different classes of allocation

will tend to reduce the allocative efficiency of the eventual outcome. It will do this by precluding water ending up being used in its most valuable use because restrictions are placed on trading between different classes of use. Unless there is a clear hierarchy of values attributed to all water in the various uses ascribed a special ranking in the hierarchy, providing separate allocations and prohibiting trading between them will result in allocative inefficiency.

## **THE BCSD'S "BEST USE SOLUTIONS MODEL"**

Peter Neilson has already outlined in this session of the Conference the BCSD's proposals relating to tradable rights for commercial water. I will not repeat his description of the proposal. I will limit myself to making some comments on it in light of the lessons from establishing other markets I have just outlined.

Firstly, there are several very good features of the proposals:

- They have a strong focus on the need for the rights and obligations of the participants in commercial water trading to be well defined. This is consistent with Lesson 2;
- They propose the separation of the right to take water from the right to use water. This is consistent with an observation made in the context of Lesson 6;
- They propose that there be a minimum of restrictions on trading in water use rights between those with allocations from the consented use pool (CUP). This is also consistent with an observation made in the context of Lesson 6; and
- They pay particular attention to the regulatory framework in which trading will be allowed to operate and in the transition from current arrangements to a situation in which trading is possible. This is consistent with Lesson 1 and Lesson 5.

There are also a number of features of the proposals that are not so good:

- Tradability is restricted to rights allocated for commercial purposes within the CUP. There is no ability to trade between the public use (recreation) pool and the CUP, for example. This is contrary to the points in Lesson 6 and is unlikely to result in optimal allocative efficiency in the use of water because there are likely to be occasions when water would yield higher benefits if used for recreation than the CUP purpose to which it is put, and vice versa;
- It is not clear from the proposals how it is intended to ensure that the non-CUP requirements are not set inefficiently high. As Lesson 5 makes clear, initial allocations can and do matter to dynamic efficiency and when rights are not tradable. The BCSD is proposing that its non-CUP allocations not be tradable; and
- It is proposed that if total allocations need to be reduced the CUP entitlements will be scaled pro rata. I have commented on pro rata scaling under Lesson 5, but the more serious issue is that it is not clear when and how, and by whom, the decisions about scaling will be made. The importance of specifying such details in advance was highlighted in Lesson 2.

Overall, however, the BCSD's "Best Use Solutions Model" is a useful contribution towards a greater understanding of the potential for increased tradability of water rights to help resolve the increasing conflicts in New Zealand between parties for access to water. It also helps identify some of the limitations of tradability as a tool. The BCSD is to be commended for its useful contribution.