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Proposal for a UK domestric water trading scheme

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Abstract

Water charges in the UK, Ireland, Canada and parts of the USA, are largely based upon house value rather than consumption. This paper shows how charges based upon consumption could facilitate trading amongst metered consumers, and provide incentives to non-metered customers to switch to a metered tariff. To develop a household domestic water trading scheme various environmental trading schemes were examined, including European Union Emissions Trading Scheme (EU ETS) and Tradable Energy Quotas (TEQs). The derived scheme for water incentivises domestic consumers to trade and reduce their use of the resource. Although a degree of trading would be possible on an occasional basis with un-metered properties (by the substitution of appliances with water conserving models), and conventionally metered properties (based upon sustained reductions in consumption, but on an annual basis), frequent full trading would only be possible if smart water meters were installed. We conclude that, whilst water trading schemes are feasible, they present a number of challenges. However, due to the availability of a number of existing potential elements, implementation, at least on a regional basis, could be achievable relatively quickly. Once an initial scheme is running it could be refined and expanded to other regions, and nationally or internationally, if appropriate.

1 Water conservation in perspective

Since 2003 it has been a legal requirement for the Government of England and Wales to encourage water conservation and report on progress every three years (Section 81 of the Water Act 2003[1]). '*To regulate in a way that provides incentives … for customers in England and Wales*', is also part of the Office of water services' (Ofwat)

mission statement. Additionally, one of the requirements of the EU Water framework Directive[2] is for Member States to '*ensure by 2010 that water-pricing policies provide adequate incentives to use water resources efficiently and to recover the true costs of water services in an equitable manner'*. So, there is a significant and timely political and environmental need to develop appropriate water conservation incentives for users not only in the UK but elsewhere.

The cost of water is critical to the success of any incentive scheme[3]. For charges to be related to consumption, the volume used must be measured, but currently only 26 % of UK homes are metered[4]. Various studies to investigate the costs and benefits of installing meters throughout the UK have concluded that metering costs are high in relation to the benefits. Apart from the purchase cost, there are the installation, maintenance, reading and verification costs, and the potential social and health costs particularly for poor families. The Policy Studies Institute[5] have demonstrated the value of different tariff structures but with all there would be winners and losers. Also, water charges in the UK are some of the lowest in Europe[6]. So there is little incentive for UK householders to request a meter and be billed accordingly. However, in regions such as the South East of England, water stress (withdrawals / availability) is classified as severe, comparable with the situation in much of Southern Europe.

Simply installing a meter will not necessarily produce a lifestyle change resulting in long–term water savings. For example, this quote from the Government's Energy Review could equally apply to domestic water – '*The main obstacles to the take up of energy efficiency are lack of information about costs and benefits, absence of appropriate incentives, and lack of motivation among customer*.'[7] . So if metering will

not motivate water efficiency, what alternatives or complimentary approaches could be applied in the UK and elsewhere?

Brown[8] has suggested that the principles of carbon trading schemes could be applied to the water sector. For example, she considers the case of a developer who retrofits water saving appliances into housing association properties with payment being in the form of in-kind water allowances. The result would be water savings in older houses with commensurate water saving appliances installed in new build houses as part of the planning requirements. Although this innovative approach addresses the issue of water conservation infrastructure in buildings, it does not influence user habits. As an element of a more comprehensive scheme, the approach proposed by Brown could be valuable.

Traditionally, people are encouraged to reduce their consumption of a product, or generation of pollution, in exchange for reduced costs. However, trading schemes tend to incentivise the participants more than the usual restrictive conservation measures as each participant is allocated a limit or provided with a specific allowance. This creates awareness of the value of a commodity by generating, or enhancing, the commodity's market. Users with extravagant consumption will have to reduce or purchase additional allowances. Those with low consumption will have excess allowances that can be sold and traded.

Currently, the most comprehensive trading scheme in the world is the European Union's Emission Trading Scheme (EU ETS). This scheme is multinational and addresses the major emitters of carbon dioxide (CO_2) in a way that encourages them

to change processes and practices to reduce carbon emissions[9]. So, could the EU ETS be translated for use in a water context? A critical examination of the theory, structure and experiences of trading schemes is used below as a precursor to the development of a domestic water trading scheme (DWTS) that could provide incentives for householders to save water and invest in water meters.

2 Background to environmental trading schemes

Environmental trading schemes were first suggested in the 1960s[10,11], first implemented in the USA and have since grown in size and coverage. Although trading schemes are simple in concept they tend to be complex in practice to ensure their operability and fairness. However, trading schemes are very good at creating, or developing, markets and making the participants aware of the cost of the commodity involved; few, if any, other mechanisms are as effective[12] .

In outline, environmental trading schemes are typically initiated when a limit is imposed, or agreed, on a particular commodity, eg water, greenhouse gas emissions or food. The limit is normally applied over a time period, eg 5-20 years, and may be subdivided into reporting periods. Users are constrained by legal requirements, or voluntary agreements, as appropriate. If the commodity limit, often called a ‘cap’, is set below existing use, users are encouraged to cut consumption. The cap is divided into appropriate allowances for the individual participants. The allowances may be distributed by an authority using a declared methodology (formula) or by auction.

Each participant must determine if they have sufficient commodity for their needs. Those with a deficit can make changes to reduce consumption or must buy more commodity. At reconciliation, each user surrenders the appropriate number of commodity rights, or allowances, for that period, or they may be subject to a punitive fine. Hence each user can chose the lowest cost way of obtaining the match between allowance and use. The trade of allowances may take place throughout the scheme, or at specific times depending upon the design and administration method. The incentive to trade is normally to minimise costs, but it could also be to minimise environmental impacts. To date, the perfect trading scheme has not been produced, they all have flaws. However, the evolving nature of the schemes and the economic theories and models that support them should help schemes improve and gain acceptability.

A fundamental issue with environmental trading schemes is the ownership of the commodity concerned. With water, it can be argued that as rain falls on everyone; water should be owned by all and is a right, not a commodity. This argument ignores the fact that most water is not suitable for drinking and that the work and equipment involved in treating and distributing water needs to be paid for. However, as most water is not drunk, there are arguments that water is over-treated and people should not have to pay for a quality they do not require[13].

Whilst many people will be willing to pay an increased price, as water is a necessity its price has to be carefully considered. Although the cost of water is low compared to other utilities, there are people who have difficulty paying for it. Any proposed increase needs to be related to the customers' abilities to pay[14,15].

One common fundamental problem with environmental trading schemes appears to be an almost complete lack of trading[16]. Another problem with such economic incentives is the inadequate consideration of externalities for the particular market[17]. Trading schemes generally take many years to develop and need regular reviews to ensure fairness and achievement of the aims. While the concept is simple and straightforward, and most participants want winners and losers in order to stimulate trade, in practice no one wants to be a loser.

3 Methodology

As noted above, the use of a trading scheme for domestically supplied water has been suggested by Brown[8] as a concept at developer and housing association level. To determine whether a wider domestic water trading scheme (DWTS) is indeed feasible, a literature review was undertaken evaluating existing trading schemes; assessing their suitability for adaptation to the water sector. Collated information was then structured to identify key details of candidate trading schemes (see Table 1).

Table 1a. Candidate trading schemes - International

Scheme title	Lessons for water	Key facts or summary
European Union Emissions Trading Scheme EU ETS Phase 1	This scheme has a structure that is readily applicable to a water trading scheme	Trial emissions trading scheme for CO2 in the EU
European Union Emissions Trading Scheme EU ETS Phase 2	As for phase 1 +. Links with other schemes create options and also increase uncertainty	First phase of Kyoto linked Europe wide CO2 trading scheme

Table 1b. Candidate trading schemes - National

Scheme title	Lessons for water	Key facts or summary
United Kingdom Emissions Trading Scheme UK ETS	Relative targets do not limit consumption as well as absolute targets, but relative targets are simpler to police	Relative cap UK only scheme to obtain tax rebates
Energy Performance Commitment EPC -proposed UK ETS United Kingdom Emissions Trading Scheme	The quality of smart meters and their communication network are key to the operation of such schemes	Mandatory scheme proposed for industry that is not covered by EU ETS covering energy usage not emissions
Local exchange trading schemes (LETS)	The service and skills based, links could be made with water conservers who could help others implement water savings	Non-financial trading scheme between local individuals, but linked nationally through LETSlink UK
Landfill Allowance Trading Scheme (LATS)	If the reconciliation date was staggered throughout the year the administration burden could be levelled and ease the development of regular trading	Waste disposal authorities landfill allowance trading scheme to help the UK reduce biodegradable municipal waste (BMW) to reach its EU Landfill Directive obligation
Water Rights Trading (UK)	This existing scheme could be linked to the proposed scheme by development plans that would change the volume of water currently being abstracted	Water abstraction licence holders can trade water rights to provide flexibility to manage their water needs
Waterfind (Australia)	The concept of participants donating allowances to others, instead of trading them in the market, is an option that could be considered in the	On-line water market set up to enable irrigators' excess water to be donated to environmental projects

	future	
Solvent Trading Scheme	The predetermined cap reductions could be applied to water use areas, communities or individual households for long term planning of water resource development	The USA's first cap and trade scheme for industrial solvent users with a progressively tightening cap
Transferable water permits for Tasman district in the Waimea plains	Trials need to be conducted in areas that may not be the most water stressed, as the price of failure could be too high	New Zealand scheme with permanent and temporary water permit transfers for urban and rural users in the Wellington area
NOx Budget Trading Program (NBP)	The one off allowance to help at the start of the scheme, to maintain service, could be translated to a special rebate for communities joining the scheme	Cap and trade scheme for installations over 25MW to reduce national ozone levels in the USA
Acid Rain NOx Reduction Program	The relative targets of this simple straightforward scheme may explain its longevity	Scheme to reduce acid rain in the USA by reducing SO2 and NOx through allowance trading.

Table 1c. –Candidate trading schemes - Regional

Scheme title	Lessons for water	Key facts or summary
Hunter River salinity trading scheme	On-line trading works. Good adequate consultation is vital	Control of saline discharges in to the river to improve its freshness
Watermove	Trading can be carried out by other means than just on-line. Currently, it would be too ambitious for a first stage trial	Confidential water trading in the Victoria area of Australia with exchanges every Thursday creating a volume limited 'pool price' within the various trading

		zones of the region
Interstate Water Trading Project, Murray Darling Basin	The concept of 'no new water' could usefully be applied to various developments	No new water, so existing water rights to irrigators have to be traded to conserve resource
Manawatu-Wanganui Regional Councils Oroua Catchment Plan	The lack of trading may be related to the apparent threat that the scheme makes if it is put in operation. The link to an environmental event suggests that for a UK water trading scheme, this could be paralleled for a drought situation.	The First regional plan developed under the New Zealand Resource Management Act to include a transferable water permit scheme as part of a resource management plan for the river. Transfers can only take place once the river level has dropped below a threshold (30% mean flow) So far there has been no trading
Transferable water permits for Tasman district in the Waimea plains	Trials need to be conducted in areas that may not be the most water stressed, as the price of failure could be too high	New Zealand scheme with permanent and temporary water permit transfers for urban and rural users in the Wellington area
Regional Clean Air Incentives Market RECLAIM	The linking of an industrial scheme with a personal scheme is novel but the issue of fraud puts this model into question	To improve air quality in the area around LA by trading allowances outside of state limits

Table 1d. Candidate trading schemes - Personal

Scheme title	Lessons for water	Key facts or summary
Personal Carbon Trading domestic tradable quotas (DTQs) or tradable energy quotas (TEQs)	Computer administered trading needs to be adopted if the scheme is expanded to the whole country's 24	Trading within a carbon budget by every individual at each transaction, to create awareness of carbon and help reduce emissions and pollution worldwide

	million households. Free allocation of allowances would not be applicable to water due to distribution and treatment costs.	

As the EU ETS is the largest and most developed scheme it arguably provides the best basis for a water trading scheme. Many of the issues of competitiveness, monitoring, transparency and allocation methodology have been resolved and the lessons learnt could be applied to a DWTS. However, as EU ETS only covers major industrial emitters, it would need considerable modification to deal with households.

A personal form of trading scheme that has been proposed in the Carbon emission field is known as DTQs (Domestic Tradable Quotas) or TEQs (Tradable Energy Quotas)[18]. Such schemes, based upon the global ownership principal, provide every human with an equal allocation of credits in a carbon account. Every transaction would include an exchange of carbon credits for the associated carbon cost, by using a form of credit, or identity, card account. Such a scheme would require large investments and commitment on a national, if not international, scale[19] but the concept has received Government backing as a long term possibility[20]. A DWTS could form a bridge between the established large scale upstream schemes, such as EU ETS, and the much more downstream schemes like the proposed TEQs. The links and parallels between the key elements of EU ETS, TEQs[21] and a hypothetical DWTS are set out in Table 2.

Table 2 - Comparison of trading schemes

EU ETS	Hypothetical DWTS	TEQs
Allocation method by grandfathering	Allocation by meter records	Allocation by entitlement
Allocation method by benchmark	Allocation by water audit	Allocation by auction
Sector classifications	Consumption profiles	Individual or organization
National cap	National or regional or catchment cap	Carbon budget
New Entrant Reserve (NER)	New development reserve – if required	Auction
Closure issues	Demolition of property / change of use	Retirement of quotas
Reconciliation	Reconciliation (annually)	Budget monitoring (constant)
Trading of allowances	Trading of allowances	Trading of quotas
Links with JI and CDM	Schemes undertaken by communities could have benefits distributed to the affected households and others in the community. Schemes outside of a catchment area could be considered to be similar to CDM projects.	Possible transfer of some quotas to other countries for holidays and business travel

Table 2 indicates that some links between the schemes are stronger than others and some will need further work to develop.

4 Proposed basis for a domestic water trading scheme

4.1 Scope and limitations

By examining various extant and planned schemes (as discussed above), it is possible to outline a basis for a UK DWTS. Most schemes rely upon metering to determine use of the controlled substance (eg fuel, water, etc), however it has to be accepted that in the UK, for the foreseeable future, the majority of users will not be metered. Although a national scheme would be appropriate in some countries, the ownership of water companies and the large number of water catchment areas in the UK suggests that a regional catchment based scheme would be the ideal and this fits in with the principles of the Water Framework Directive[2]. The outline structure of a proposed scheme is shown in Figure 1. The key elements are expanded upon in the following paragraphs.

Figure 1 to go hereabouts

4.2 Water Audit

The simplest way of determining household water consumption would be to use water meters. However, meters[22] have only been fitted in all new houses in the UK since 1989, so alternative means are needed in the vast majority of the housing stock. One way of dealing with the lack of metering is to utilise water audits to determine baselines, changes, and investigate complaints. In a similar way to tax returns, householders could be required to complete an assessment that would provide the basis for determining their water use rating and hence their water bill. Audits could be

conducted annually and submitted with the annual electoral roll reviews. The data obtained through the audit needs to be processed to determine consumption and any indicative trends.

Another approach is to build upon the method used in the various established environmental rating schemes such as BREEAM (BRE environmental assessment method) and LEED (leadership in energy and environmental design). These use simple spreadsheets and average values for benchmarks, but can be restrictive in their suitability for non-standard situations.

Alternatively, a simple survey could be conducted by a trained professional auditor or by the householder with guidance. An example of a user-conducted audit with good guidance is the Canadian 'Wise Water Use Guide'[23] .

Some aspects of an audit may already be held on databases that could be accessed by appropriate bodies. Such databases include: the electoral roll, planning records, recent census, tax return, credit rating and market intelligence databases. Although it may be useful to collect as much information as possible, this must be balanced against cost, time, civil liberties, data protection and freedom of information issues.

4.3 Water charge determination

From the audited returns, annual consumption volumes can be calculated for each household. It will be more justifiable than the current rateable value based charge. Metered installations' consumption will be determined from the meter readings, and adjusted where necessary using information obtained from the audit, especially when

a meter has not been installed for the full accounting period. The benefit of conserving water could be translated into reduced treatment costs resulting in lower supply charges. However, any additional administration costs due to running the scheme can be wholly or partially passed on.

In addition, the appropriate externalities will be calculated and fed in. Although individual external influences may be small, their consolidated effect needs to be incorporated into the pricing of water. The ExternE project has been carried out for over 15 years into externalities[24]. It has produced a methodology for energy that is applicable to water due to the study's comprehensive methodology.

4.4 Un-metered trading (rebate)

The overall objective of the scheme is that householders will be able to moderate their consumption and save water. Un-metered dwellings will have a restricted annual scheme of rebates and audits. If the householder has no interest in trading they may continue to pay the projected charge.

Un-metered households cannot make financial savings by changing habits, but by installing water conserving appliances and then applying for a new water audit, which will revise the chargeable volume, until another audit or the property is sold. A similar UK scheme is currently in operation for commercial properties using the Enhanced Capital Allowance (ECA) scheme that enables firms to recover all of the capital expenditure against taxable profits[25]. Within the ECA there are currently three schemes; one covers water conserving products.

Such a scheme could provide un-metered users with the additional incentive to request a meter to enter fully into the trading scheme and save more than any cost associated with a meter. Although metered installations would not need to obtain 'approved' appliances to enable trading, promotion of such appliances to the un-metered installations could encourage metered customers to regularly review their own appliances.

4.5 Metered trading

Metered customers will have the greatest opportunities for savings and to benefit from trading as they will be able to trade any monthly surplus throughout the year. The administrators of the scheme have a dual incentive to make trading work for the metered householders; a) encourage further take-up of meters, and b) collect more accurate data on water use for better water management[26].

As demonstrated above, the building blocks needed to instigate a household domestic water trading scheme in the UK are generally available and have been tried and tested. Table 3 sets out some of the established components that could be used to put together a pilot scheme. And Figure 2 suggests a detailed structure for such a scheme.

Table 3- Building blocks of a domestic water trading scheme

Basic structure (Fig 1)	**Proposed DWTS**	**Existing 'blocks' that could be utilised**
Audit	Allocation determined from meter records	Existing water records

	Allocation determined from water audit	BREEAM, / Hamilton A guide to Wise Water Use
	Consumption profiles	Demographic database profiles (as used by DCLG for planning)
	Demolition of property / change of use	Planning guidance and policy
Determination of charge	Determination of relevant externalities and their impact on the water price	Results of the ExternE project by the European Commission and the USA Department of Energy
	New development reserve – if required	Planning guidance and policy
	Reconciliation (annual event)	EA or SEPA, RDAs or Water UK
Trading	National or regional or catchment cap	EU ETS process
	Trading of allowances	Carbon market traders
Rebate	Un-metered users appliance rebate scheme	Enhanced Capital Allowance scheme and the Water Technology Lists
Incentives for metering	Full trading	UK ETS
Possible future links	Community based projects	Planning process, Housing Corporation, other Member States

Figure 2 to go hereabouts

5 Example scenario

To illustrate how trading could be implemented amongst households a worked example is provided (see Table 4). It compares four different households: (A) a single

working person household with a metered supply, (B) a four person household containing two adults (one of whom is in full-time employment) and two children with a metered supply, (C) a retired couple with a metered supply, and (D) an unmetered version of household B.

Each household is assumed to possess a six litre WC, a 120 litre bath a 12 l/min shower, a 10 l/min kitchen tap, a 5 l/min basin tap, a 50 litre / cycle washing machine and 20 litre / cycle dishwasher. By applying appropriate usage frequencies the weekly consumption figures for households A-D are 1.2, 3.5, 2.4, and 3.5 m^3/week respectively.

For the purposes of this illustration, the following tariffs have been applied in the first year:

A1 A flat rate of £340 a year

B1 A flat metered rate of £2.50/m^3

C1 Initial rate of £1.0 per m^3 for up to 20m^3, second rate of £2.0 per m^3 over 20m^3

D1 Initial rate of £1.0 per m^3 for up to 20m^3, second rate of £2.0 per m^3 from 20 to 50m^3, third rate of £3.0 from 50 to 100m^3, forth rate of £5.0 over 100m^3

After a base year to determine their allocation, the households adopt different approaches to the imposed allocations. The single man gives up using the bath, the family invest in replacement shower head and low flow basin taps, but the retired couple change nothing. As the allocation is always less than the 'business as usual' situation trading should be required.

The first two households obtain a surplus of water units (say m^3), but the third has a deficit. Although the retired couple could ignore the deficit and not trade, they would be hit with a fine for exceeding their allocation. The fine is high enough to encourage trading at a lower cost.

Table 4. Comparison of costs and scenarios over two years of trading

		Household			
		A	**B**	**C**	**D**
Consumption in Year 1 (m^3)		56	164	112	164
Consumption in Year 2 (m^3)		52	156	124.8	156
Yr 1 trading costs	Trading benefits (£)	0	0	0	0
	Fines (£)	0	0	0	0
	Expenditure on appliances (£)	0	0	0	0
Yr 2 trading costs	Trading benefits (£)	40.00	80.00	-128.00	400.00
	Fines (£)	0	0	234.80	0
	Expenditure on appliances (£)	0	180.00	0	0
Yr 1 tariffs	Tariff A 1 (£)	340.00	340.00	340.00	340.00
	Tariff B 1 (£)	140.00	410.00	280.00	340.00
	Tariff C1 (£)	92.00	308.00	204.00	340.00
	Tariff D1 (£)	98.00	550.00	290.00	340.00
Yr 2 tariffs	Tariff A2 (£)	340.00	340.00	340.00	340.00
	Tariff B2 (£)	130.00	390.00	312.00	340.00
	Tariff C2 (£)	84.00	292.00	229.60	340.00
	Tariff D2 (£)	86.00	510.00	354.00	340.00

Table 4 shows that in the first year benchmarks are in effect set for subsequent years. Only in the second year does the impact of trading start to emphasise the need to change lifestyles. The tariff structures will impact the overall costs to the consumers, but careful structuring of the metered customers can take place to ensure that financial incentives continue to drive efficient water use. Once, most customers have had

meters installed, the need for trading, in the format proposed, will reduce. However, without water trading, it might be difficult to encourage such a take-up of meters.

6 Discussion and Conclusions

The proposed DWTS is not perfect; it has weaknesses, but also considerable strengths. When compared to other trading schemes, the main conceptual weakness is the established market for water. Unlike carbon, where a new market was needed, people are already paying for water. The main practical weakness is that it is, as a whole, unproven. A gateway may be needed, as in DTQs, to enable trading with other markets such as personal carbon and EU ETS.

Questions such as: 'who should be responsible for cap setting and organising trading?', and 'what are the operating overheads?', do not have clear answers. The allocator of responsibilities would normally be the Regulator, on a national basis, or a regional authority on a regional basis. Although the cap could be seasonally varied, it is far simpler to have an annual cap to enable planning to take place. As with all charges, there will be appeal procedures put in place. If the customer did not agree with their allocation set within the region's cap, they could appeal, but any increase in an individual's allocation would need to be taken from other household's allocations as the regional, or national, cap must not be exceeded. Water companies could operate a scheme, but Ofwat or CCfW could also oversee or operate one. Other possible operators include: EA, local councils, or GLC in London. However, an independent respected operator could be crucial to the success of a scheme by instilling confidence in investors and minimising time inconsistency problems[27].

The main strength is that the scheme provides incentives to all existing customers and such a scheme is needed to fulfil National and European legal requirements. Another important feature is that it can be basin or catchment limited. This would enable pilot schemes to be run with relatively low levels of commitment. Also, the basic structure can be used to develop different schemes to provide appropriate incentives in a locality and link with other issues such as planning and inter-catchment trading.

Sustainability is not just a concern of industry, but also the individual. To date, although individual carbon trading schemes have been proposed, it is only industrial schemes (such as EU ETS) that have been set-up and run. Hence, the main models for water trading, or management of any other individually consumed resource, are currently mainly industrially based. The candidate trading schemes show that extensive involvement of all stakeholders is needed, if they are to succeed and the different stakeholders have focussed viewpoints. Economists and environmentalists tend to dismiss political issues and advocate the implementation of pure theory, issues of competitiveness and security of supply are not considered significant enough to deviate from the fundamental principles. However, Governments tend to complicate schemes; they address issues of fairness and competitiveness whilst also considering the economic and political impacts of environmental issues. Such conflicts of interests and outlook would occur in a DWTS, but with some different players. Within the stakeholders for a DWTS will be the key gatekeepers that can enable such a scheme to be developed[28].

The scheme needs to be financially viable and cost effective for both the consumers and the suppliers. Water Companies need to maintain profitability and realise measurably reduced consumption. Also, the Regulator needs to be convinced that the scheme is beneficial, fair to both consumers and water companies, legal, and that no other better alternative is available.

As with any scheme there will be winners and losers, but potentially, everyone could win. Water companies could minimise expenditure on expanding supplies and meet their legal obligations. Customers could reduce their consumption and hence their bills. However, there could be degrees of winning. Metered customers with smart meters have the potential to win the most – if they can continually reduce their consumption. However, the same customers could lose significantly if they increase their consumption. So, the power to be a winner or loser is in the hands of the customer.

For the water companies, they may win whatever the customer does. Profligate consumers will contribute more through higher charges; economising consumers will require less supply. Even if more people economise than expected, the Water Company could, in theory – if permitted by the Regulator, just increase prices and charges to maintain an appropriate return. Regulators could cap charges to impose financial penalties on companies that have not met previous targets and requirements. Regulators could also set the allowance limits for householders, the trading unit values and the conditions.

There are legislative needs for a mechanism to incentivise domestic water users in the UK to save water and the DWTS scheme outlined above could help enable the UK achieve the 2015 target for the Water Framework Directive. Due to the lack of universal metering a scheme is required that does not rely upon meters, but will encourage un-metered householders to become metered. DWTS provides incentives and paves the way for a more justifiable water charging structure. The building blocks needed to instigate a DWTS in the UK are generally available.

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Figures

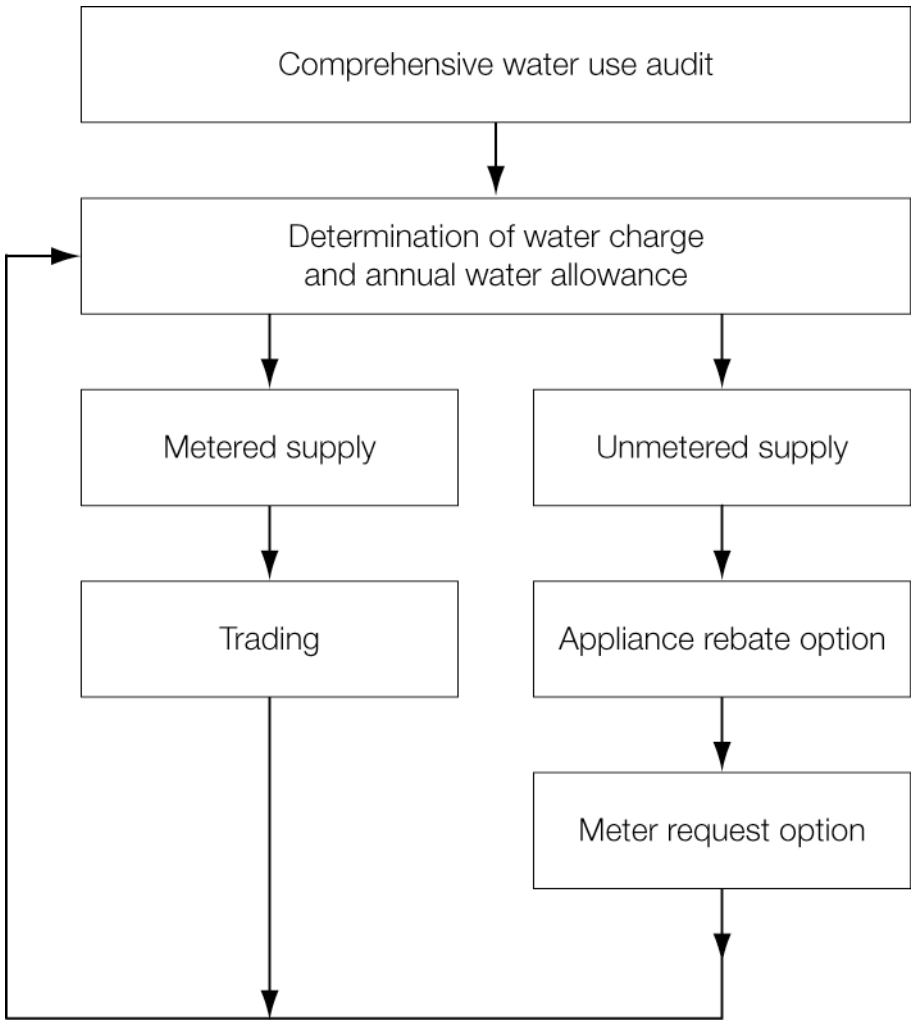


Figure 1 Basic structure of a proposed DWTS

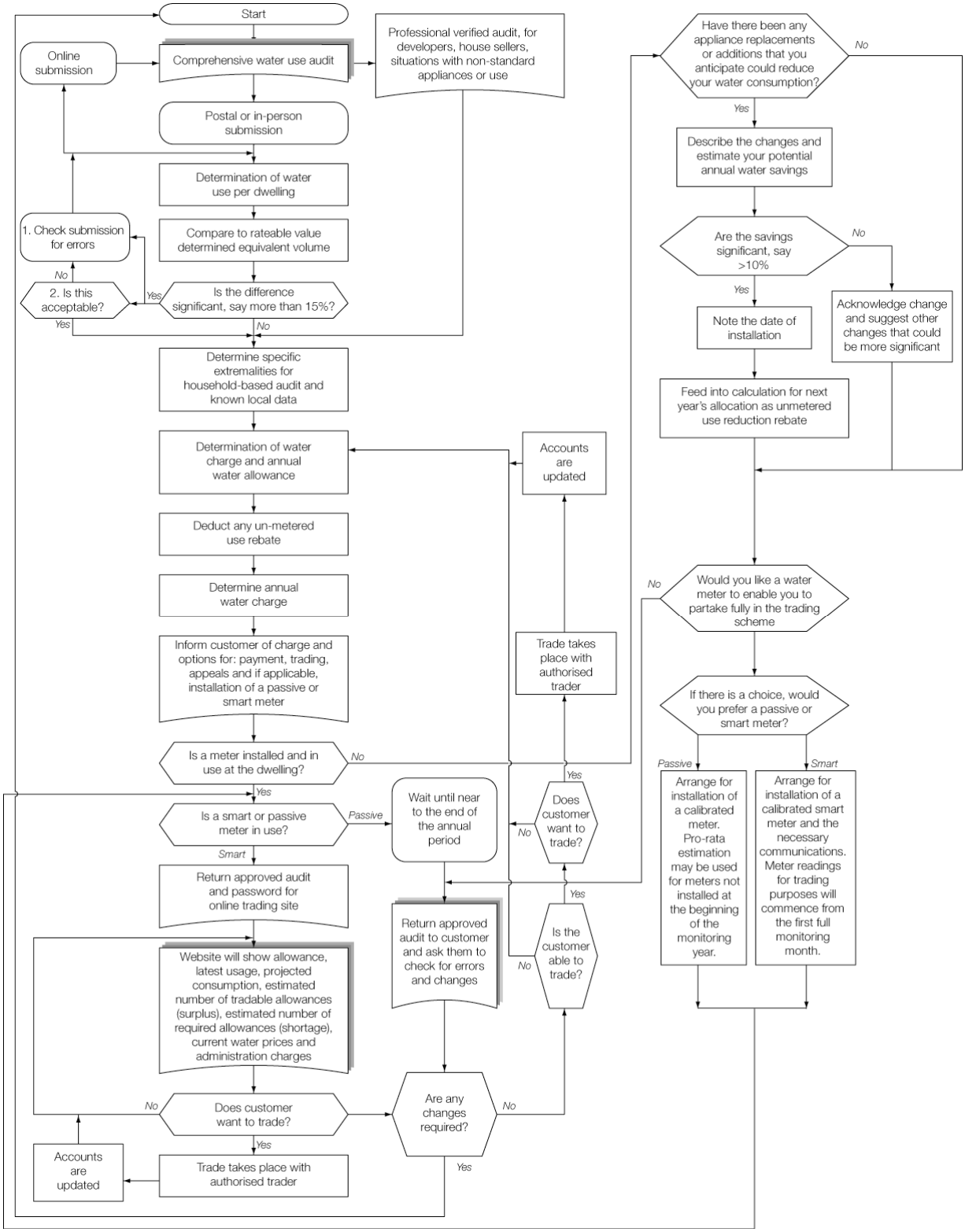


Figure 2 Detailed structure of a proposed DWTS



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Griggs, John; Jeffrey, Paul

2007-01-01T00:00:00Z
Thomas Telford
http://dx.doi.org/10.1680/ensu.2007.160.4.157
Griggs, J and Jeffrey P. Proposal for a UK domestic water trading scheme. Engineering Sustainability, Vol.160(4), December 2007, pp157-165.

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