

Achieving Water Neutrality in the South East Region: Discussion Paper

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This paper suggests a way to help ensure that the draft South East Plan Implementation Plan (SEERA 2006) is sustainable. It suggests 'water neutrality' as a mechanism for achieving behavioural change, as recommended in the Implementation Plan:

- "The Plan is not just about delivering investment in infrastructure but also maps out the need for stakeholders to work together to effect behavioural change in the way the region uses the full range of resources; natural, physical and financial" (para. 1.7)
- "Reducing the demand for and use of resources is a fundamental component of the South East Plan. Behavioural changes in particular have the potential to substantially change the nature of the infrastructure requirements..." (para. 3.3)

In the Regional Policy Framework CC2 (Climate change) and CC3 (Resource use) both recognise the importance of resource efficiency and behaviour change.

Although this paper uses water as an example, 'neutrality' could also work for the other policy areas identified in the Policy Framework and the Implementation Plan as requiring behavioural change: travel behaviour, production of waste, consumption and use of energy.

Background (SEERA 2006a, 2006b, 2006c; IPPR 2005)

Water supply in the greater South East is already a problem. The region is one of the driest parts of the UK and yet experiences the highest levels of demand. In some parts of the region public water supplies are at critical levels with demand close to exceeding supply.

The problem will get worse even in the absence of more development in the South East. Per capita water consumption in the region is increasing, and shows no signs of levelling off. Climate change is expected to lead to drier, warmer summers, increasing water demand. The European Habitats and Water Framework Directives are likely to require a total decrease in water abstraction, to achieve adequate water quality and levels.

Increasing water supply is not a short-term solution. Reservoirs take at least 10-15 years to get planning permission, be built, and become operational. Also, in an already crowded region reservoirs must compete for space with other forms of development.

Behavioural change is needed. There is potentially enough water in the South East to meet the rising demand for new housing and domestic consumption, but only with the timely provision of new water resources and high water efficiency savings. The Environment Agency modelled various scenarios of housing growth (from RPG9-level growth rates to 36,000 new dwellings/year); 0% v. 8% v. 21% reduction in per capita water consumption in new homes; and 0% v. 76% of projected deficit met from new supplies. Regardless of the scale of housing growth, the scenario of further resources plus 21% reduction in consumption in new homes led to virtually no water deficits by 2025; and the scenario of no new resources plus no improvements in water efficiency led to almost universal deficits. So with significant change in people's behaviour to use less water, the problem is soluble in various ways, but without behaviour change, no plausible permutation of other measures will solve the problem.

Behavioural change only by new households and businesses will not solve the problem in the short to medium term. In the absence of new water provision, any increase in housing and employment will add to the problem unless this development does not make any additional demand on water resources.

A way of dealing with the challenge: water neutrality

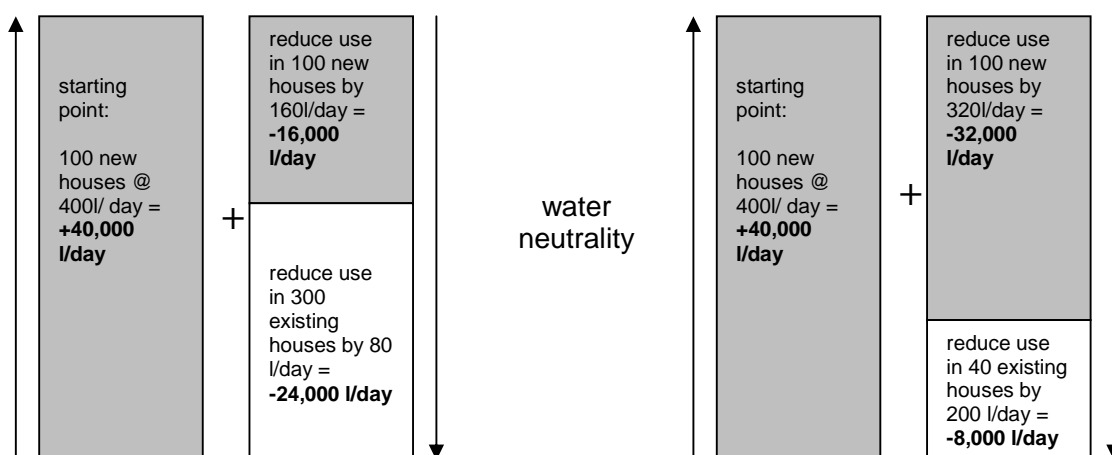
This report proposes water neutrality as a way of achieving demand-side reductions, in part through technical measures and in part through behavioural change:

Water neutrality: For every new development, total water use in the region after the development must be less than or equal to total water use in the region before the development.

Water neutrality could apply to any scale of new development, and to employment as well as housing development. Essentially it allows for any level of growth, provided that any *increase* in water use caused by the growth is fully offset by *decreases* achieved as part of the overall 'package'. Water neutrality can be achieved by a combination of strong water efficiency measures in new developments and measures to reduce overall water consumption. This is most likely to mean metering and retrofitting water efficiency improvements in existing developments, but could, for example, include developers working with water providers to reduce leakage.

Example 1: A new housing development of 100 houses is expected, without any constraining measures, to use 40,000 litres of water per day (400 l/household/day). Water efficiency measures of 40% in the new housing (low flow showers, dual flush loos, water butts, water efficient appliances) bring this down to 240 l/household/ day. Retrofits of 300 existing houses that reduce their water consumption by 20% (saving 80 l/household/day) would be needed to achieve water neutrality.

Example 2: Same scenario, but radical water efficiency measures of 80% in the new housing (rainwater harvesting, composting toilets, greywater recycling etc.) bring this down to 80 l/household/ day. Retrofits of 40 existing houses that reduce their water consumption by half would be needed to achieve water neutrality.



Example 3: A householder wants to build a granny flat, with estimated pre-mitigation water use of 160 l/day. The householder installs water efficiency measures that reduce use to 60 l/day, and pays an agency that organises retrofits to houses in their district equivalent to 100l/day.

Retrofits work (BBC 2006; EEA 2003?; Mayer et al. 2000; NSWG 2006)

Retrofits of existing housing and employment development are feasible. For instance:

- a combination of leakage reduction, pricing reforms, educational programmes, funding of water saving devices etc. meant that water use in Sydney (Australia) did not increase between the mid-1970s and 2006, despite a population increase of nearly 30%;
- a home water conservation study in Seattle showed that installation of new toilets, washing machines, showerheads and tap aerators led to an average per capita reduction in water use of 37% ; participants rated the new toilets and washing machines higher than the old fixtures in every category;
- the UK national water metering trials of 1989-1993 showed an average reduction in consumption of 11% when water meters were installed.

Per capita water consumption in Germany and Denmark, both countries with high quality of life, is roughly 80% that in the UK.

SWOT analysis of water neutrality

<p>Strengths (of proposal)</p> <ul style="list-style-type: none"> • Harnesses creativity of private sector; fosters innovative market solutions • Enables development to go ahead: removes major planning hurdles • High, positive profile for the region • Promotes more efficient water use; neutrality principle provides a mechanism to decouple economic and housing growth from environmental damage • Technical innovations around retrofitting could turn into an economic benefit for the region • Provides a level playing field, except at the edges of the region • Some of this may happen anyway due to water companies applying for scarcity status, e.g. compulsory water meters 	<p>Weaknesses (of proposal)</p> <ul style="list-style-type: none"> • May have undesirable unintended consequences, but overseas examples imply this is unlikely • May be seen as promoting a monitoring culture • New and thus potentially risky • Regulatory challenge re. enforcement penalties • Could have disproportionate impact on affordable housing • Has to be visible to be effective because: technical fixes on their own do not change behaviour
<p>Opportunities (for promoting proposal)</p> <ul style="list-style-type: none"> • There is a well-recognised need for action on this topic. Drought orders, hosepipe bans – public is aware that the current situation is problematic • Sustainability appraisal and IPPR report support behaviour change • There is anxiety and controversy about the assumptions in the South East Plan • Government expects more progress on sustainable development from the region 	<p>Threats (to proposal)</p> <ul style="list-style-type: none"> • May need new powers to implement: does the region have the authority to make required changes to regulatory framework and enforce them? • Resistance to change among those affected. May be seen as too difficult, with increased provision seen as the answer • Must be high impact and visible to change behaviour, not just raise awareness. Could therefore be dismissed as too radical/impractical

Gains and losses under water neutrality

	Gains	Losses
New housing occupants	<ul style="list-style-type: none"> Cheaper running costs Houses get delivered faster: they have a house to move into Positive contribution to sustainability 	<ul style="list-style-type: none"> Greater up-front costs
Existing housing occupants	<ul style="list-style-type: none"> Free retrofits Lower running costs (assuming metering) House improved (as in Seattle) 	<ul style="list-style-type: none"> New housing in the neighbourhood (but they would come in time anyway) Initial inconvenience around installation of retrofits: financial incentive may be needed
Developers	<ul style="list-style-type: none"> More planning certainty Harnesses developers' creativity: opportunity for forward-thinking developers In time, quicker turnaround time (especially if a centralised agency carries out retrofits, audits etc.) 	<ul style="list-style-type: none"> New rules to learn; capacity building to adapt to new system Greater up-front costs, possibly lower profits Proportionally greater impact on smaller builders
Planning officers	<ul style="list-style-type: none"> Role changes from restricting to enabling development Potentially fewer planning appeals Reduced risk of 'failure of an LDF' due to water problems 	<ul style="list-style-type: none"> New rules to learn; capacity building to adapt to new system Planners not currently involved in water planning: involves new burden
South East Region	<ul style="list-style-type: none"> Improved reputation for forward thinking, innovative and sustainable solutions, exciting new agenda Opportunity for major pilots (eg 'Pathfinder' projects) as demonstration projects Good will of existing residents Reduces risk related to appropriate assessment under Habitats Directive, and uncertainty of impact of Water Framework Directive Consistent with, and supportive of, Eco-footprint approach promoted in South East Plan New business, employment and training opportunities 	<ul style="list-style-type: none"> Potential competitive disadvantage with neighbouring regions, particularly at borders because of increased cost of new/existing homes
All regional residents	<ul style="list-style-type: none"> Lower risk of drought orders, taps running dry, etc.; and high charges by water companies for emergency stopgap supplies 	<ul style="list-style-type: none"> Higher costs in short term?

	Gains	Losses
Water companies	<ul style="list-style-type: none"> • New commercial models - working with developers. Possible enhanced role as 'water services' provider • Less dependent on new reservoirs. • Better delivery on RBM& other WFD requirements • Less risk of drop in share prices, punitive fines from regulators, public hostility due to failure to reconcile supply obligation, environmental constraints and costs 	<ul style="list-style-type: none"> • New rules to learn; capacity building to adapt to new system • Ofwat rules may obstruct
Other	<ul style="list-style-type: none"> • Helps to simplify the planning system • Growth area for retrofitters 	Existing shortage of plumbers etc would be exacerbated

Additional issues

Baseline levels: Water supplies are already over-abstracted. Stronger measures than water neutrality may be needed to reduce abstraction to levels required by Habitats Directive and Water Framework Directive.

Affordable housing: are different rules needed for affordable v. market housing (e.g. more requirements for retrofits from market than affordable housing)? What are implications of such rules, e.g. for cost, local residents' acceptance of housing?

At what scale does one consider neutrality? Issues around small-scale development: need for implementing agency? Can retrofits happen anywhere in the region, or just in the same local authority, or should they be near the new development?

Need to test/prove when a development is 'water neutral'. May require up-front charging in escrow to help ensure that adequate measures are put in, before development becomes operational. May require auditing agency (perhaps a providing agency?).

Education/marketing of life cycle cost of water neutrality. Water neutrality would increase up-front cost. Public may need to be convinced that long-term costs would reduce.

Are there any differences for employment v. housing development?

Regulation: What measures, legal changes etc. are needed to allow SEERA to enforce neutrality?

'Leading the horse to water'. These measures help to provide the technical measures that allow households to be less profligate with water, but this alone will not guarantee changes to behaviour. Additional measures – e.g. different pricing structures, requirements for meters to be installed in all homes etc – may be needed to make the most of the

technology. Need to monitor real change in behaviour: risk of greater water use in response to cost savings.

Technical change expertise is available from current change-over to digital radio, compulsory water meters, and earlier change to natural gas involving much refitting of appliances.

Conclusion

SEERA should consider 1. including requirements for neutrality (water, energy etc.) in the South East plan because there is no responsible alternative; and 2. discuss with DEFRA, DCLG and LGA how to get a regulatory framework to make it possible.

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