



POSITION PAPER

January 2009

Water Industry Contribution to Climate Change

Synopsis

- The Australian urban water industry is a significant consumer of energy and, consequently, a producer of Greenhouse Gas emissions
- The industry’s operations are susceptible to the impacts of climate change. It is therefore incumbent on the industry to show leadership by reducing its own Greenhouse Gas emissions.
- The relative contribution of the water industry on a per capita basis to greenhouse gas (GHG) emissions is small, albeit the industry’s overall consumption is significant.
- Energy used in heating water is a much larger contributor to GHG emissions than the delivery of water or the treatment of wastewater. There is therefore much to be gained from demand management
- AWA is generally supportive of the federal Government’s Carbon Pollution Reduction Scheme, although the AWA believes that some aspects of the Scheme’s design could be improved.

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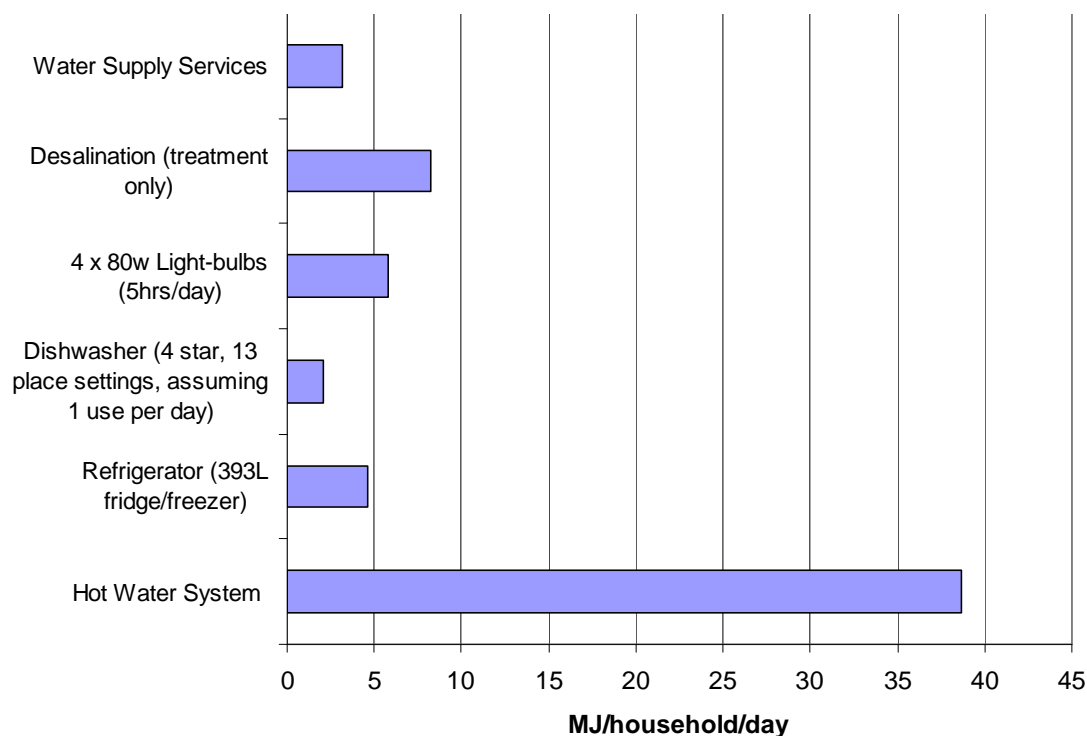
Background

As noted elsewhere in this series, water industry operations are particularly susceptible to climate change impacts. It therefore behoves the industry to mitigate its own greenhouse emissions. Such a response will demonstrate sound corporate responsibility and educates consumers. Consumer education is particularly important as there are significant greenhouse gas implications of water supply activities at the household level.

Issues

Sources of Water Industry GHG Emissions

Greenhouse gas (GHG) emissions are commonly associated with energy use. Energy is used in the distribution of raw water, its treatment (where applicable), its reticulation from households following use, and the treatment and disposal of waste water. The intensity of energy use is largely dependent upon topography. Where gravity can be taken advantage of to reticulate water and wastewater, energy intensity (a measure of energy consumption per unit of production) will be lower. Melbourne, for example, uses significantly less energy to distribute potable water than Sydney because its protected catchment areas are at elevation, although there is a large energy requirement for pumping a proportion of Melbourne’s wastewater to the coast for treatment and disposal. Other local conditions can also affect energy use *and* GHG emissions, such as there being no need for water to be treated in Melbourne because of its highly protected catchments and the proportion of natural gas, much of it generated at Melbourne Water’s Werribee sewage treatment plant, which is used as an energy source (and which generates fewer GHG emissions).



Source: Kenway, S., and McMahon, J. (2007) Water, wastewater, energy and greenhouse Gasses in Australia’s Major Urban Systems (*Reuse '07*, Sydney)

Water Industry Energy Use in Context

While the water industry uses a large amount of energy, in context the actual energy consumed per head of population served is relatively low at 590 megajoules per person per year. This is about 0.2% of the total energy consumption of the average Australian (approx. 257,000 MJ per annum (ABS, 2004)). The figure above shows that per capita and per household water provision is not a significant user of energy in the context of other common household appliances.

This figure is not provided as a justification for inaction, but to place the industry’s energy use in context for the discussion that follows. There are several points to note:

With regard to the industry’s emissions:

- The industry generates GHG from other sources, critically including the generation of methane (the Global Warming Potential of which is 23 times that of CO₂) and CO₂ in wastewater treatment. Increasingly methane is recovered and used in the production of energy, but significant emissions remain
- GHG emissions also arise from the degradation of plant material in storages, the discharge of nitrogenous compounds to the environment (in wastewater) and other sources
- Its use of materials, goods and services also *embodies* energy and by extension greenhouse gases
- Despite a comparatively low energy usage per capita, total energy used by major metropolitan water authorities is significant. Sydney Water, for example, is one of the more significant users of electrical energy in NSW.

While the above, and potentially others not listed, have been identified as sources of industry GHG emissions, there remains a need to quantify these emissions and develop strategies to mitigate or counteract them. AWA intends to support its members in their conduct of GHG emission audits and to develop a database of information to assist in the auditing process, through its relevant Specialist Networks on *Sustainability* and *Response to Climate Change*.

With regard to households

- Water and wastewater service activities at the household level also generate greenhouse gases. For example, as shown in the table above, energy used in the heating of water is a significantly greater contributor to household energy consumption than the supply of water in the first place. (Water supply consumes just 15% of the energy used to heat water once it is delivered.)
- Pumping of water from rainwater tanks produces greenhouse gas emissions and energy use in smaller pumps per unit of production is considerably greater than the larger pumps used in reticulated systems. Where rainwater tanks are 'topped up' from mains supplies during times of low rainfall, there may be a doubling of energy usage. Depending on the location of the rainwater tank, water will need to be 'repressurised' to distribute it from the tank to the household

Energy Reduction through Demand Management

Demand management has had benefits in terms of GHG emission reductions at the household level that were unanticipated. In particular, heating costs avoided through demand management have led to a reduction in GHG of 178,000 tonnes of CO₂ since 1999 or 8% of total household CO₂ emissions. With regard to GHG from rainwater tanks, there is a paucity of data available to determine whether emissions are significant or not and how such emissions would compare with emissions from alternative sources, such recycled water, further demand management initiatives and the like. Additional research is required. The case illustrated here, however, shows the need for caution in adopting alternative approaches before the data to support decisions is available.

Industry Response to Carbon Pollution Reduction Scheme White Paper

The Australian Water Association made a detailed response to the Government's *Carbon Pollution Reduction Scheme Green Paper* and has closely monitored developments presented in the subsequent *White Paper*. It is likely that only a limited number of facilities will be caught under the Scheme, although a larger number of entities will be required to report their emissions under the National Greenhouse Energy Reporting System (NGERS). AWA has expressed a number of concerns about the design of the scheme, principally that:

- The methodology for calculation of emissions from wastewater treatment facilities does not follow international practice and should be reviewed
- That transitional strategies need to be put in place to ease the transition from state-run schemes such as the Greenhouse Gas Reduction Scheme (GGAS) in NSW and the ACT; the Queensland Gas Scheme; the Mandatory Renewable Energy Target (MRET) and others. This will be important lest the value of investments made under these schemes be lost.



The above having been said, AWA generally supports the CPRS and has called for Australian industry to support the Scheme. The water industry will be one of the sectors most affected by climate change and the industry therefore has a vested interest in GHG mitigation. To this end the AWA would urge the Government toward adoption of GHG reduction targets toward the upper end of its announced range.

Summary of AWA's Position

AWA will support members in their efforts to audit and manage their GHG emissions. The Association believes the following:

- A strong leadership commitment is required. While the per capita energy used for the delivery of water and wastewater services is low compared to other sources, AWA believes it is incumbent on the industry to demonstrate commitment to GHG emission reduction. The Association will provide leadership in this regard.
- The industry should support the adoption of the Carbon Pollution Reduction Scheme, albeit changes in some aspects of the scheme would be desirable.
- Industry understanding of its own GHG emissions needs to improve. The AWA supports the auditing and reduction of greenhouse emissions from current industry operations
- New water resource developments should be greenhouse neutral where possible
- Energy trade-offs in most water management decisions should be explicitly identified and taken into account in decision-making
- Lower energy options should be adopted where possible
- The energy intensity of new capital works should be explicitly considered in the planning process. This has implications for energy intensive processes such as desalination
- The industry should seek greenhouse offsets and green energy opportunities whenever economically possible

To a large extent achievement of the outcomes proposed above is the industry's responsibility. Nevertheless, AWA believes it is the Government's responsibility to take the industry's position and initiatives into account in its own planning and that this will become increasingly important if the Government funds the development of new water resources in future, as it has recently suggested it will.

References

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