The potential role of NHH water use benchmarking in encouraging business water efficiency

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Introduction

Benchmarking is one way to help generate interest amongst businesses in water use and in measures they can take to improve their water efficiency and their position relative to the benchmark.

Action 2.5 in the RWG Water Efficiency Action Plan is to "*Scope out an approach for creation of indicative user benchmarking….*"

As part of delivering this action this paper presents a rapid review of relevant and readily accessible international and UK experience of NHH water use benchmarking to encourage NHH/business water efficiency. It then goes on to make some suggestions as to options for a future benchmarking system.

International NHH water use benchmarking examples

The NABERS scheme in Australia (National Australian Built Environment Rating System) is required for most sellers or lessors of office space of 1,000 sq m and above. It assesses the ongoing energy performance of a building using actual utility consumption data, with the resulting NABERS rating represented by 0-6 stars. Benchmark data that reflects things such as staff numbers, floorspace and climate is used to generate the star rating thresholds. The scheme has been extended to include water ratings for offices, shopping centres, apartment buildings, hospitals and hotels. Over 800 office premises have water efficiency ratings covering 13 million m^2 of floorspace with total water saved over 10 years calculated at 1240 Ml. There is evidence that the office scheme has driven pull with average office ratings increasing from 3.4 to 3.7 over the 10 years. In addition to offices the water option is used by 16 hotels, 47 apartment buildings and 157 shopping centres. Businesses don't receive funding. Nor do they receive specific recommendations on what to do to improve their rating. That is left to the market to provide. Similar schemes to NABERS are being trialed in India, Indonesia and Hong Kong.

In the USA many cities are participating in voluntary water benchmarking efforts, and about one dozen were reported in 2017 as requiring some type of mandatory water benchmarking of commercial and industrial facilities. For example San Jose has a Building Performance Ordinance that requires commercial and multifamily buildings that are 20,000 square feet or larger in size to track their energy and water use and share it with the City. This data will

then used to request/require improvements. The US Energy Information Association also now includes water use when it surveys energy use in over 46,000 commercial buildings allowing benchmarking by floorspace and per person.

In Singapore it is mandatory for large water using businesses to submit their consumption data to the national water agency. This data is used to compile publicly available benchmarking information for a range of sectors including hotels, office buildings, retail operations, wafer fabrication & semiconductor plants, commercial laundry, data centres and biomedical manufacturing facilities. It is very easy for NHH water users to see how they compare with other similar users. The benchmarking data can also be referenced in Water Efficiency Management Plans that are required from high water using businesses. Funding isn't provided to businesses for the benchmarking scheme although sector specific guidance and benchmarking data is available,

Sector	Median Value
Office Buildings (with Water-Cooled Cooling Tower)	1.0 m^3 / m^2 / year
Retail	1.3 m^3 / m^2 / year
	2.6 L / p / d
4-star Hotels (with Water-Cooled Cooling Tower)	0.36 m^3 / Guestnight
5-star Hotels (with Water-Cooled Cooling Tower)	0.57 m^3 / Guestnight
Primary Schools	11.9 L / p / d
Secondary Schools	14.8 L / p / d
Junior Colleges	17.3 L / p / d
Data Centres	2.6 m^3 / MWh
Commercial Laundries	12.3 m^3 / tonne
	Average Recycling Rates (%)
Water Fabrication Plants	45%
Semiconductors (Excluding Water Fabrication Plants)	23%
Biomedical Manufacturing	14%

Disclaimer:
The figures indicated in the table may exclude tenants' usage.

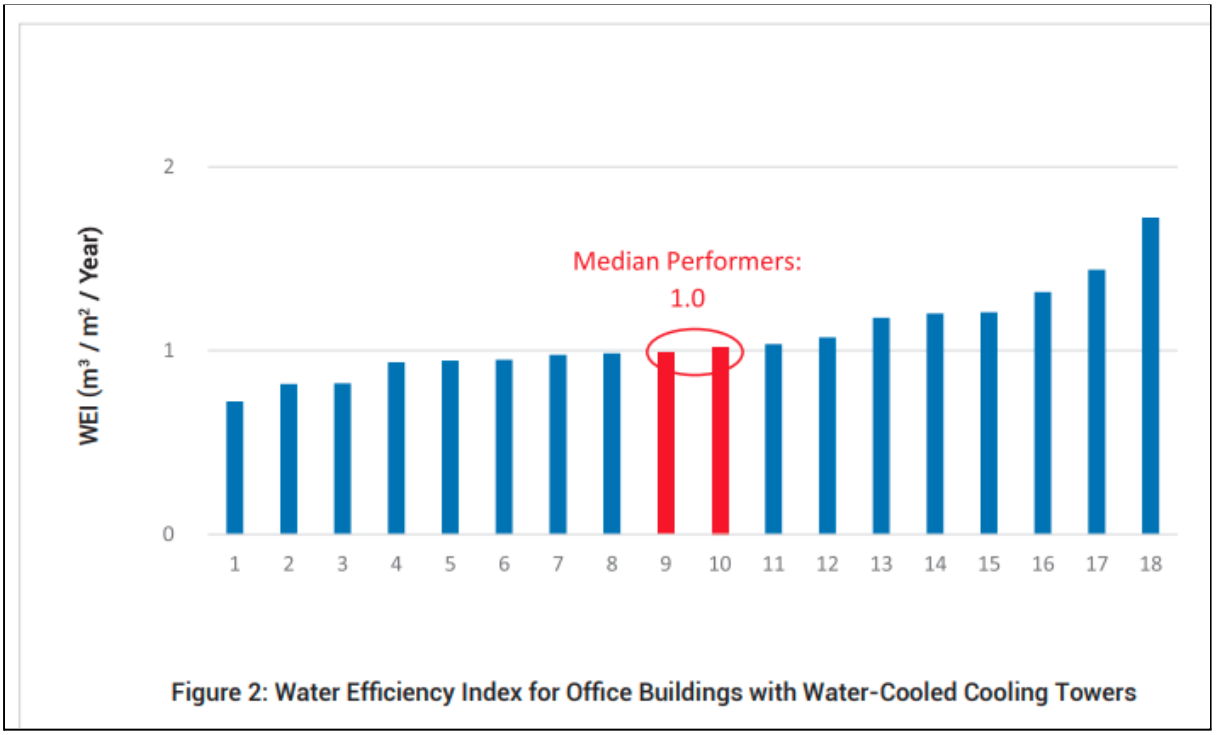


Figure 2: Water Efficiency Index for Office Buildings with Water-Cooled Cooling Towers

Around 10 years ago the National Business Water Efficiency Benchmark (NBWeb) Tool was developed collaboratively by water suppliers from across Australia to provide central benchmarking information to encourage business customers to use water more efficiently.

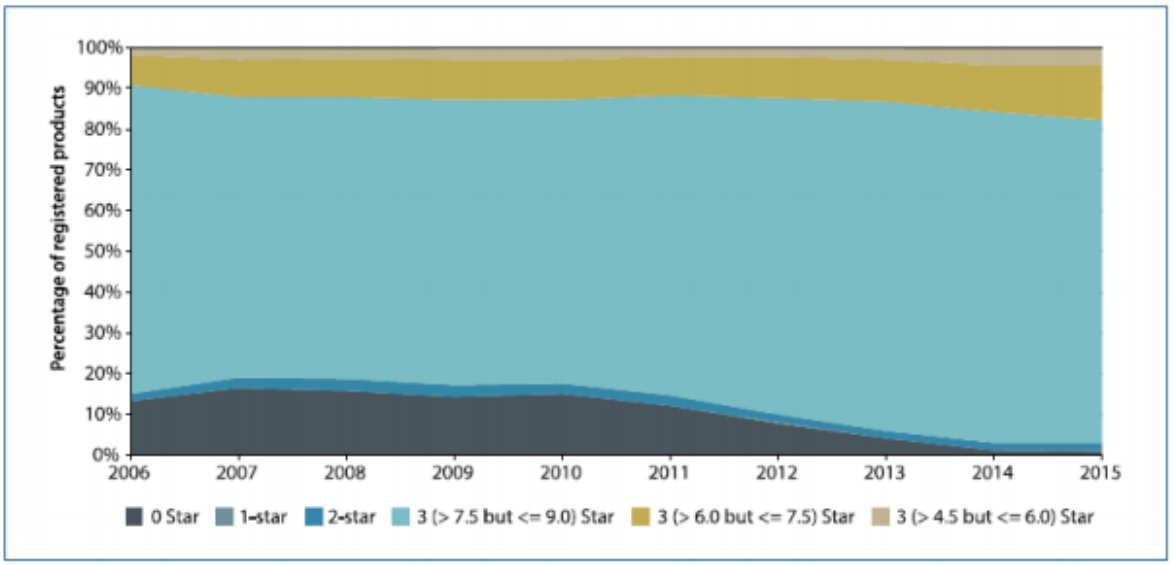
The central website appears to no longer be live with benchmarking information now held on each of the water providers websites. For example The Water Corporation in Perth includes open access benchmark data on its website for a range of NHH types including hotels, offices, shops and care homes, as does Sydney Water's website.

Some water using sectors have also taken the initiative on benchmarking and have used it to help drive improvements within a sector. For example the beverage industry where a 2018 study evaluated the performance of nearly 1,600 beverage manufacturing facilities distributed across 6 continents and represented 19 different companies.

CDPWater undertakes an annual disclosure exercise with over 2,900 companies on water risks and water security on behalf of investors. As well as a detailed annual disclosure report that sets out how companies are responding to water management risks they also publish an A list of those companies they judge to be leaders. Their scoring from A - D measures the comprehensiveness of disclosure, awareness and management of water risks and best practices associated with environmental leadership, such as setting ambitious and meaningful targets.

As well as international examples of NHH consumption benchmarking there are also strong examples of product benchmarking through efficiency labelling which have been demonstrated to generate pull for more water efficient products. In Singapore the mandatory water label increased the market share of 3 star washing machines from 37% to 87% in 5 years. In Australia in 2007, dish washing machines with a WELS 3 star and below accounted for nearly 90 percent of all sales; however, by 2013 these dishwashing machines accounted for less than 20 per cent of all sales. For showers similar trends are observed with less efficient products disappearing from the market.

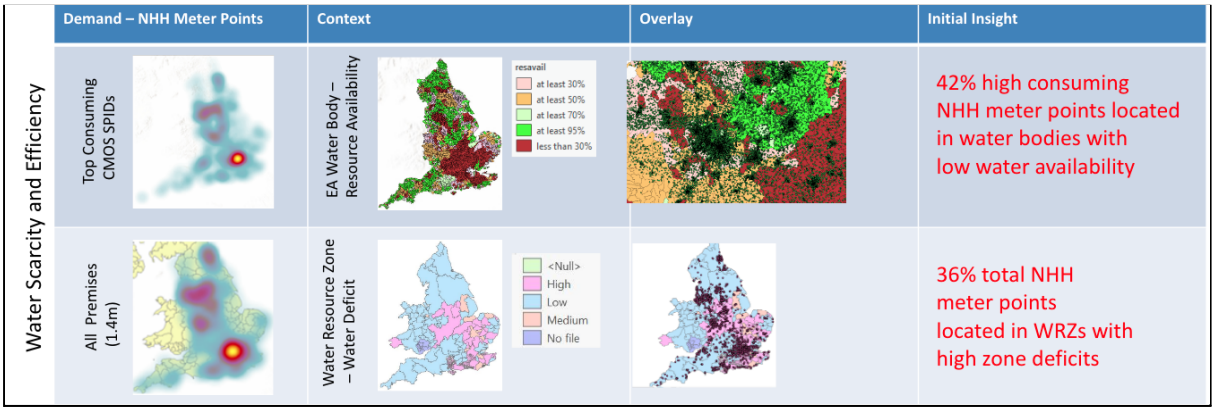
Figure 22. Shower percentage of product star ratings – 2006 to 2015



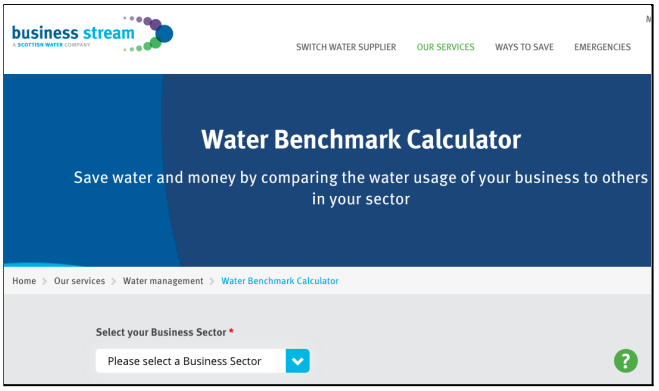
Source: Aither, based on Australian Government 2015d and ISF 2014.
Note: Data for 2015 was downloaded from WELS Scheme Product Register on Thursday 9 April 2015.

NHH water benchmarking examples in the UK

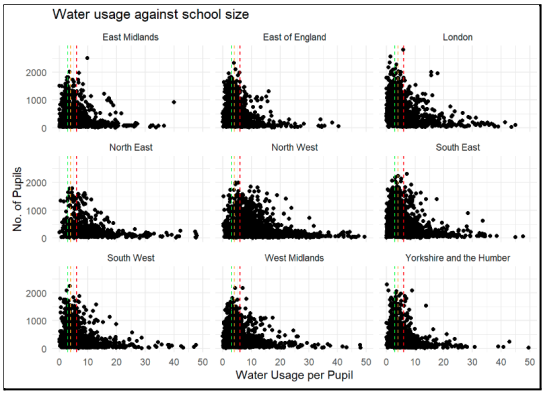
MOSL centrally holds actual water consumption data for over 1 million NHH supply points. This data can be segmented and analysed by retailer, by geography, by business type, over time and by usage. It can also be overlain with other data sets such as water availability.



Business Stream has developed an online business water use benchmarking tool which uses published benchmark information on typical NHH water usage for over 20 business types coupled with information input by the user on usage and the characteristics of their site/operation. Currently the tool is only open to existing customers. First Water Business also has an online WaterDeck benchmarking tool which allows comparison of consumption across multiple sites within a business and also with published benchmarks however it is also restricted to existing customers.



Thames Water has developed a business water use calculator that benchmarks usage and suggests possible savings. The tool is not publicly available.



Some sectors such as Education (DfE) are looking to use benchmarking to inform targeting of water efficiency activity and potential investment. In this case looking at consumption v pupil number.

BEIS is currently consulting on introducing a mandatory in use NABERS type system in England initially just for energy and for large office buildings but eventually for other industrial and commercial buildings and potentially to include water. Such a scheme could

provide an added incentive for businesses to seek advice and solutions from retailers and others to improve their rating.

Potential Benchmarking Options the Action Plan could Propose
Based on the above review a number of possible non exclusive benchmarking options have been identified that could be progressed separately or together to encourage a greater pull from businesses for water efficiency services. These include:

1. **Developing an open source benchmarking tool** - develop and promote a version of the existing benchmarking calculators that is independent and free to use. NHH water users can use it to compare their consumption with benchmark figures. It could provide suggestions on how they could save water or just signpost where they can go to get further information leaving that to the market. This approach could work well at a business level but less so at a sectoral level.

2. **Enhancing the MOSL CMOS system to provide user benchmarking insights** - additional data fields in CMOS could be set up and populated with supply point business characteristics needed for benchmarking. This would allow CMOS consumption data to be used to provide far better insights into how use at a supply point compares with both theoretical benchmarks and/or directly with others in the same sector (e.g. Education, Health) or geography.

3. **Including water use in any mandatory government led rating scheme** - the in-use performance rating scheme that BEIS are currently considering for commercial buildings in England could be widened to include water (as it does in Australia). The scheme provides a visible rating compared to benchmarks but leaves it to the market to provide services to improve the rating.

In addition, the government could commit to include products typically used in NHH sites in any future mandatory **water efficiency labelling** scheme (e.g. urinals, commercial dishwashers) to allow businesses to select benchmarked water efficient products