

## 8.1 E12—Total net greenhouse gas emissions (net t CO<sub>2</sub> equivalent per 1,000 properties)

### 8.1.1 Introduction

This indicator reports the contribution of the utility's operations to greenhouse gas (GHG) emissions. Utilities' calculations are required to refer to the National Greenhouse Accounts Factors published by the Australian Government Department of the Environment and updated annually. GHG emissions are reported in net terms; that is, any quantity of carbon sequestered through activities such as the purchase of carbon offsets is deducted.

The National Greenhouse Accounts outline three distinct types of emissions factors that may need to be calculated to estimate the full greenhouse impact of an organisation's activities:

- direct emission factors (Scope 1), which calculate the quantity of carbon dioxide equivalent (CO<sub>2</sub> equivalent) emitted per unit of activity, at the point of emission release;
- indirect emission factors (Scope 2), which calculate the greenhouse impact of purchasing and consuming electricity (that is, the impact of burning fuels such as coal or gas at the power station); and
- various emission factors (Scope 3), which include the impact of various activities, such as the disposal of waste, employee business travel, and the transportation of products.

In 2008–09, the method for calculating GHG emissions for reporting to the Urban NPR changed, with Scope 3 emissions being excluded from the reported value. At the same time, the Urban NPR reporting framework adopted the National Greenhouse and Energy Reporting System (NGERS) approach to calculating fugitive emissions in preference to one previously specified by the Australian Greenhouse Office. The differences between these two approaches were the conversion factors used to estimate GHG emissions and the recognised offsets, such as green energy, used to reduced net emissions in prior years.

Comparing different utilities' net GHG emissions is a difficult exercise. It should be undertaken with caution because of the number of variables affecting emissions. Those variables include the source of water; gravity versus pumped networks; geographical conditions (which influence the need for pumping); the number of large-volume customers and the extent of industry within the customer base; the prevailing greenhouse policy in the jurisdiction; and the method of calculation.

Of the utilities, only Melbourne Water exceeded the Australian Government's threshold of 25,000 tonnes of CO<sub>2</sub> equivalent to 92,701 tonnes and was required to make payments under the Government's carbon pricing scheme until June 2014. In 2013–14, 26 utilities reported increases in GHG emissions and 24 reported decreases. There was a 1% increase in the national median of GHG emissions from 2012–13 to 2013–14 (Table 8.1).

**Table 8.1 Overview of results: E12, 2012–13 to 2013–14 (net t CO<sub>2</sub> equivalent per 1,000 properties)<sup>1</sup>**

Size group	Range		Number of utilities with increase/decrease from 2012–13		Median		% change in the median from 2012–13
	High	Low	Increase	Decrease	2012–13	2013–14	
100,000+ connected properties	731 WC (Perth)	26 City West Water	5	3	266 <sup>†</sup>	260 <sup>†</sup>	-3%
50,000–100,000 connected properties	873 Goulburn Valley Water	205 P&W (Darwin)	2	8	422	370	-12%
20,000–50,000 connected properties	1,134 Fitzroy River Water	114 Clarence Valley	7	7	417	441	6%
10,000–20,000 connected properties	1,604 WC (Kal–Boulder) (W)	167 Byron	12	7	402	416	3%
All size groups (national)	1,604	26	26	25	391 <sup>†</sup>	394 <sup>†</sup>	1%

**Table notes**

<sup>1</sup> Median total net greenhouse gas emissions is calculated using data from all utilities supplying both water and sewerage services which reported data for E12 for both 2012–13 and 2013–14.

<sup>†</sup> As a result of changes to reporting boundaries for SA Water, the 2012–13 total net greenhouse gas emissions uses data for metropolitan Adelaide while the 2013–14 figure uses whole of SA Water data.

## 8.1.2 Results and analysis

### 100,000+ group

In 2013–14, total net greenhouse gas emissions varied significantly in this group, from 26 to 731 t CO<sub>2</sub> equivalent per 1,000 properties. The median level for the group was 260, down 3% from 2012–13 (Table 8.2).

The highest emissions (731 t CO<sub>2</sub> equivalent per 1,000 properties) were reported by Water Corporation (Perth), 44% higher than the next highest utility, Hunter Water. The three Melbourne utilities (City West Water, Yarra Valley Water, and South East Water) reported the lowest emissions; however, this is primarily because most of Melbourne’s bulk water and sewage treatment and pumping is conducted by Melbourne Water (see section 10.8 for greenhouse gas emissions data for bulk utilities, including Melbourne Water).

The greatest increase was also reported by Water Corporation (Perth) with 10%. This was driven primarily by increase in consumption at the Southern Seawater Desalination Plant in Binningup (Western Australia). This was followed by Yarra Valley Water, which reported an increase of 9%. Excluding SA Water (because of a change to its reporting basis in the 2014 Urban NPR) the largest decrease (11%) was reported by South East Water and was the result of lower demand for recycled water during summer, which reduced operating times for treatment plants (South East Water 2014).

**Table 8.2 E12, 2009–10 to 2013–14 (net t CO<sub>2</sub> equivalent per 1,000 properties), for utilities with 100,000+ connected properties**

Utility	2009–10	2010–11	2011–12	2012–13	2013–14	% change from 2012–13
WC (Perth)	532	573	647	663	731	10%
Yarra Valley Water	40	42	40	41	44	9%
Hunter Water	448	455	438	381	412	8%
Barwon Water	390	416	403	266	274	3%
City West Water	7	–3	–4	25	26	0%
Sydney Water	164	143	72	85	85	0%
ACTEW	422	362	313	288	260	–10%
South East Water	45	48	50	59	53	–11%
SA Water				422 <sup>†</sup>	287 <sup>†</sup>	–32%
Unitywater					225	

**Table notes**

<sup>†</sup> As a result of changes to reporting boundaries for SA Water the 2012–13, total net greenhouse gas emissions uses data for metropolitan Adelaide, while the 2013–14 figure uses whole of SA Water data.

**50,000–100,000 group**

In 2013–14, the median level of greenhouse gas emissions for this group reduced by 12% to 370 t CO<sub>2</sub> equivalent per 1,000 properties (Table 8.3). The highest result was reported by Goulburn Valley Water (873), followed by Gippsland Water (580); these were also the highest emitting utilities within this group in 2012–13.

Minimal changes in greenhouse gas emissions were reported in 2013–14 compared with 2012–13. The greatest increase (9%) was reported by Central Highlands Water. The greatest decrease (14%) was reported by Gosford City Council, which has consistently reported decreases since 2010–11. This may continue into the future as a result of pumping station and sewage treatment upgrades, including the installation of two methane-powered heaters that are used to heat digesters. The use of methane as a fuel reduces both direct greenhouse gas emissions and reliance on other energy sources (Gosford 2013: 42)

**Table 8.3 E12, 2009–10 to 2013–14 (net t CO<sub>2</sub> equivalent per 1,000 properties), for utilities with 50,000–100,000 connected properties**

Utility	2009–10	2010–11	2011–12	2012–13	2013–14	% change from 2012–13
Central Highlands Water	848	305	236	228	250	9%
Goulburn Valley Water	562	448	777	848	873	3%
Western Water	404	411	320	282	267	–5%
Coliban Water	767	490	487	475	446	–6%
P&W (Darwin)	217	189	208	219	205	–7%
Wyang				486	441	–9%
Toowoomba				439	394	–10%
Cairns	361	354	330	308	273	–11%
Gippsland Water	1,174	1082	959	661	580	–12%
Gosford	482	536	502	405	347	–14%

## 20,000–50,000 group

There was great variability in results for this group, from 114 t CO<sub>2</sub> equivalent per 1,000 properties for Clarence Valley Council to 1,134 for Fitzroy River Water (Table 8.4). The 2013–14 median for the group was 441, an increase of 6% from 2012–13. Goulburn Wimmera Mallee Water (GWMWater) reported the greatest increase (70%), which was in part explained by a reported 29% increase in greenhouse gas emissions associated with sewage treatment (GWMWater 2014: 38). Coffs Harbour City Council reported the greatest decrease (30%).

**Table 8.4 E12, 2009–10 to 2013–14 (net t CO<sub>2</sub> equivalent per 1,000 properties), for utilities with 20,000–50,000 connected properties**

Utility	2009–10	2010–11	2011–12	2012–13	2013–14	% change from 2012–13
GWMWater	615	502	487	384	652	70%
Lower Murray Water	675	725	1092	346	533	54%
MidCoast Water	341	306	315	340	483	42%
Tamworth	457	368	374	378	419	11%
Fitzroy River Water	1,155	938	1,149	1,032	1,134	10%
North East Water	805	773	820	837	860	3%
Tweed	427	429	454	434	441	2%
Riverina Water (W)	407	307	624	365	372	2%
Clarence Valley	113	98	137	114	114	0%
WC (Mandurah)	282	280	287	306	290	-5%
Wannon Water	767	703	819	739	693	-6%
East Gippsland Water	419	404	383	380	359	-6%
Port Macquarie Hastings	103	202	222	417	386	-7%
Shoalhaven	377	408	489	423	377	-11%
Albury	540	494	528	541	451	-17%
Coffs Harbour	453	450	460	515	362	-30%

## 10,000–20,000 group

In 2013–14, emissions varied considerably in this group. Water Corporation (Kal–Boulder) (W) reported the highest amount (1,604 t CO<sub>2</sub> equivalent per 1,000 properties), and were substantially higher than the next highest (686), reported by Power and Water (Alice Springs). Byron Shire Council recorded 167 t CO<sub>2</sub> equivalent per 1,000 properties, the lowest among this group (Table 8.5).

Essential Energy reported the highest increase in this group (44%). South Gippsland Water reported the greatest decrease (20%), which can be attributed to improvements to the lagoon aeration system. This was achieved through the installation of a Series 3 wind-powered mixer for improving the quality of treated wastewater while reducing greenhouse gas emissions (South Gippsland Water 2014: 15)

**Table 8.5 E12, 2009–10 to 2013–14 (net t CO<sub>2</sub> equivalent per 1,000 properties), for utilities with 10,000–20,000 connected properties**

Utility	2009–10	2010–11	2011–12	2012–13	2013–14	% change from 2012–13
Essential Energy	998	550	572	647	930	44%
Lismore	198	69	69	210	248	18%
Wingecarribee	338	382	377	398	467	17%
WC (Bunbury) (S)	472	406	386	330	384	16%
Ballina	280	351	347	366	425	16%
WC (Busselton) (S)				297	320	8%
Aqwest–Bunbury (W)	181	176	158	159	170	7%
WC (Australind-Eaton)			337	443	469	6%
Bega Valley		72	193	331	343	4%
Eurobodalla	331	341	351	352	363	3%
WC (Geraldton)	322	471	448	419	433	3%
Busselton (W)	201	202	194	193	198	3%
Westernport Water	292	288	476	402	411	2%
Byron	471	283	363	164	167	2%
Orange	435	449	390	414	416	0%
Goulburn Mulwaree				615	618	0%
WC (Albany)	596	590	621	554	541	-2%
Dubbo	486	482	429	527	499	-5%
Kal–Boulder (S)	133	475	169	295	281	-5%
Bathurst		616	512	384	362	-6%
Kempsey	401	340	368	376	349	-7%
WC (Kal–Boulder) (W)	1,928	1,820	1,814	1,773	1,604	-10%
Queanbeyan	281	110	143	190	170	-11%
P&W (Alice Springs)	767	600	704	778	686	-12%
Goldenfields Water (R)				461	407	-12%
South Gippsland Water	723	673	429	445	354	-20%