

Mr Marcus Crudden  
Acting Director - Water  
Essential Services Commission  
2 Lonsdale Street  
Melbourne 3000

20 June 2013

Dear Marcus

## Re: Melbourne Water Energy costs

Please find below our review of Melbourne Water's energy forecasts for the purposes of the ESC's 2013 price review.

### 1. Overview

We have been asked to review Melbourne Water's electricity forecasts using the same approach as we applied in our review of electricity forecasts by the regional water businesses.

The process by which Melbourne Water's forecasts were provided, revised, considered by PricewaterhouseCoopers (PwC), and then set out in the ESC's draft decision was quite complex. In order to ensure that our analysis is robust we have set out our understanding of the process and outcomes in some detail below.

Note that this report covers the purchase of electricity by Melbourne Water, including its commitment to buy Renewable Energy Certificates (RECs), and the assumed sale of those RECs. It also includes costs associated with electricity use at the Eastern Treatment Plant (ETP) for tertiary treatment purposes. It excludes carbon price impacts associated with Melbourne Water's scope 1 and scope 3 emissions.

### 2. Melbourne Water's proposal

Melbourne Water's original proposal for the inclusion of energy costs in its operating cost forecasts, as set out in its original submission template, is below:

**Table 1 Melbourne Water original energy cost forecast (\$m, 01/01/2013)**

Component	Actual	2012-13	Water Plan forecast					Total WP3
	2011-12		2013-14	2014-15	2015-16	2016-17	2017-18	
Base forecast	20.3	23.2	29.6	32.3	31.7	33.2	33.8	160.7
Add ETP costs		3.9	7.8	8.1	8.3	8.5	8.7	41.4
Add GHG Offsets	0.8							-
Less sale of RECS			(7.5)	(7.5)	(7.5)	(7.5)	(7.5)	(37.6)
<b>Total</b>	<b>21.1</b>	<b>27.1</b>	<b>29.9</b>	<b>32.9</b>	<b>32.5</b>	<b>34.2</b>	<b>35.0</b>	<b>164.5</b>

Source: Melbourne Water submission template.

We understand that in February 2013 Melbourne Water reduced its forecasts for ETP, with the following outcomes:

**Table 2 Melbourne Water revised energy cost forecast (\$m, 01/01/2013)**

Component	Actual	2012-13	Water Plan forecast					Total
	2011-12		2013-14	2014-15	2015-16	2016-17	2017-18	WP3
Base forecast	20.3	23.2	29.6	32.3	31.7	33.2	33.8	160.7
Add ETP costs		3.0	6.3	6.7	7.0	7.3	7.5	34.8
Add GHG Offsets	0.8							
Less sale of RECS			(7.5)	(7.5)	(7.5)	(7.5)	(7.5)	(37.6)
<b>Total</b>	<b>21.1</b>	<b>26.2</b>	<b>28.4</b>	<b>31.5</b>	<b>31.2</b>	<b>33.0</b>	<b>33.9</b>	<b>157.9</b>

Source: Unpublished spreadsheets provided by Tom Walker, PwC, 3 June 2013. Figures confirmed by Melbourne Water.

The ETP costs shown in Tables 1 and 2 include a number of components, and are gross figures prior to the subtraction of revenue from selling RECs. The individual components, and net costs proposed by Melbourne Water are below:

**Table 3 Breakdown of ETP costs (\$m, 01/01/2013)**

Component	Actual	2012-13	Water Plan forecast					Total
	2011-12		2013-14	2014-15	2015-16	2016-17	2017-18	WP3
Energy component		2.060	5.056	5.415	5.702	6.014	6.253	28.440
Network component		0.657	0.839	0.839	0.839	0.839	0.839	4.194
Other components		0.257	0.436	0.436	0.436	0.435	0.435	2.177
<b>Gross Total</b>		<b>2.974</b>	<b>6.330</b>	<b>6.689</b>	<b>6.977</b>	<b>7.288</b>	<b>7.528</b>	<b>34.812</b>
Less sale of RECS		-	(1.244)	(1.803)	(2.262)	(2.767)	(3.171)	(11.248)
<b>Net Total</b>		<b>2.974</b>	<b>5.086</b>	<b>4.886</b>	<b>4.715</b>	<b>4.521</b>	<b>4.356</b>	<b>23.564</b>

Source: Deloitte calculations and unpublished spreadsheets provided by Tom Walker, PwC, 3 June 2013. Note that the sale of RECs from ETP is included in the sale of REC numbers in Tables 1 and 2.

### 3. The ESC's Draft Decision

In the Draft Decision the ESC accepted PwC's recommendations to amend Melbourne Water's forecasts in three areas:

- A reduction to base year 2011-12 expenditure of \$3.735m (which then carries through across subsequent years). This reduction reflects the difference between Melbourne Water's AGL contract price for energy, and a 'benchmark' price for energy. This benchmark was calculated using the AFMA contract rate in 2011-12 (adjusted to 2012-13 dollars) and the actual AGL contract price in 2012-13.
- A reduction in ETP energy expenditure (energy component less REC revenue) from \$17.192m to \$16.410m, across WP3. (PwC accepted the 'network' and 'other' components of the electricity costs at ETP.) PwC recalculated energy expenditure at ETP using the AFMA contract rate to establish a benchmark energy price in 2011-12, and then rolled this price forward using an SKM/MMA forecast of wholesale contract prices.
- An increase in energy costs over the baseline (and excluding ETP) associated with the carbon price from the \$12.601m proposed by Melbourne Water to \$16.863m. This was calculated by multiplying total MWh usage by an SKM/MMA forecast of the carbon price which was converted to a cost per MWh.

As a result the Draft Decision adjustments to Melbourne Water's proposed electricity expenditure were as follows:

**Table 4 ESC Draft Decision on electricity expenditure (\$m, 01/01/2013)**

Component	Water Plan forecast					Total
	2013-14	2014-15	2015-16	2016-17	2017-18	WP3
Melbourne Water (revised) ask	28.405	31.476	31.170	32.960	33.854	157.865
Reduction in base year expenditure	(3.794)	(3.823)	(3.853)	(3.883)	(3.914)	(19.268)
Net reduction in ETP energy expenditure compared to MW proposal (see table 5)	(0.826)	(0.369)	(0.360)	0.260	0.514	(0.781)
Net increase for carbon price compared to MW proposal (see table 6)	1.834	1.386	0.993	0.150	-0.102	4.262
<b>Total</b>	<b>25.619</b>	<b>28.670</b>	<b>27.949</b>	<b>29.486</b>	<b>30.353</b>	<b>142.077</b>
Net reduction in Draft Decision	-2.786	-2.806	-3.221	-3.474	-3.502	-15.788

Source: Deloitte calculations and spreadsheets provided by Tom Walker, PwC, 3 June 2013.

**Table 5 Net reduction in ETP energy expenditure (\$m, 01/01/2013)**

	Water Plan forecast					Total
	2013-14	2014-15	2015-16	2016-17	2017-18	WP3
PwC calculation	2.985	3.242	3.080	3.506	3.597	16.410
Melbourne Water ask	3.811	3.612	3.440	3.246	3.082	17.192
Net reduction	<b>(0.826)</b>	<b>(0.369)</b>	<b>(0.360)</b>	<b>0.260</b>	<b>0.514</b>	<b>(0.781)</b>

Source: Unpublished spreadsheets provided by Tom Walker, PwC, 3 June 2013.

**Table 6 Net increase for carbon price (\$m, 01/01/2013)**

	Water Plan forecast					Total
	2013-14	2014-15	2015-16	2016-17	2017-18	WP3
PwC calculation	3.444	3.783	3.290	3.390	2.955	16.863
Melbourne Water ask	1.610	2.397	2.297	3.240	3.058	12.601
Net increase	<b>1.834</b>	<b>1.386</b>	<b>0.993</b>	<b>0.150</b>	<b>(0.102)</b>	<b>4.262</b>

Source: Unpublished spreadsheets provided by Tom Walker, PwC, 3 June 2013.

#### 4. Melbourne Water’s response to the Draft Decision

In its written response to the Draft Decision, Melbourne Water sought two changes to the ESC Draft Decision.

##### Change in energy costs

Firstly, in its response Melbourne Water proposed that the real increase in energy costs should be less than proposed by PwC, and by doing so effectively sought a reduction in expenditure of \$16.32m compared to the Draft Decision. This is shown in Table 9 of Melbourne Water’s response.

Melbourne Water calculated its increase in energy costs by using a black energy price of \$65 per MWh, and then increasing this amount by the retail price index contained in a report by SKM/MMA for WSAA<sup>1</sup>. The index reflects retail price changes on an annual basis compared to 2012/13.

**Table 7 Melbourne Water revisions to energy costs (\$m, 01/01/2013)**

	Water Plan forecast					Total
	2013-14	2014-15	2015-16	2016-17	2017-18	WP3
PwC proposed increase	2.440	3.540	3.580	5.340	6.430	21.330
Melbourne Water calculation	0.290	0.980	0.660	1.420	1.660	5.010
Net reduction	<b>(2.150)</b>	<b>(2.560)</b>	<b>(2.920)</b>	<b>(3.920)</b>	<b>(4.770)</b>	<b>(16.320)</b>

Source: Melbourne Water *Response submission to the ESC’s draft decision*, May 2013, Table 9.

Subsequent to its submission Melbourne Water provided an updated spreadsheet which modifies the calculation above and seeks \$5.837m rather than \$5.010m. This revised amount reflects:

- PwC’s benchmark black energy cost of \$38.50 plus a carbon price of \$23.00
- Multiplied by the SKM/MMA retail index
- Multiplied by base year energy usage (152,867 MWh).

**Table 8 Melbourne Water updated revisions to energy costs (\$m, 01/01/2013)**

	Water Plan forecast					Total
	2013-14	2014-15	2015-16	2016-17	2017-18	WP3
PwC proposed increase	2.440	3.540	3.580	5.340	6.430	21.330
Melbourne Water revised calculation	0.317	1.014	0.794	1.696	2.016	5.837
Net reduction	<b>(2.123)</b>	<b>(2.526)</b>	<b>(2.786)</b>	<b>(3.644)</b>	<b>(4.414)</b>	<b>(15.493)</b>

Source: PwC proposed increase from Table 9 of Response to Draft Decision. Melbourne water revised calculation from spreadsheet provided by Cameron Stewart 3 June 2013.

<sup>1</sup> SKM/MMA for WSAA, *Energy Price Forecasts 2013 to 2032*, Draft 0.1 1 November 2012, table K-2

## Change in network costs

In its response to the Draft Decision Melbourne Water argued that the ESC's draft decision did not provide any allowance for changes in network costs across the regulatory period. It therefore sought an increase in costs, based on an assumption of 6.5% annual real increases in network costs.

**Table 9 Melbourne Water revisions to network costs (\$m, 01/01/2013)**

	Water Plan forecast					Total
	2013-14	2014-15	2015-16	2016-17	2017-18	WP3
Melbourne Water calculation	0.690	1.100	1.520	1.980	2.460	7.750

Source: Melbourne Water *Response submission to the ESC's draft decision*, May 2013, Table 10.

Subsequent to its submission Melbourne Water provided an updated spreadsheet which modifies the calculation above and seeks \$9.088m rather than \$7.750m. This revised amount reflects an increased calculation of the level of network costs.

**Table 10 Melbourne Water updated revisions to network costs (\$m, 01/01/2013)**

	Water Plan forecast					Total
	2013-14	2014-15	2015-16	2016-17	2017-18	WP3
Melbourne Water revised calculation	0.837	1.296	1.786	2.307	2.862	9.088

Source: Melbourne Water, email from Cameron Stewart 3 June 2013.

## 5. Approach

We have been asked to review Melbourne Water's proposed changes to electricity expenditure in light of the approach we adopted for reviewing electricity forecasts by regional water businesses. Under this approach we:

- Adopted energy costs consistent with the outcomes of a tender undertaken by Procurement Australia on behalf of a number of water businesses (and other entities). The tender has provided energy costs fixed in nominal terms for a period of three years. Beyond this time we assumed energy costs would remain constant in real terms.
- Allowed for real increases in network costs consistent with those in the AER's most recent decisions for Victorian electricity distributors (which apply until 1 January 2016). Beyond this time we assumed no real increase in network prices.

We also made a number of simplifying assumptions in undertaking our calculations. For example, we applied the AER-determined distribution network price outcomes on a financial year basis, rather than calendar year basis. Where possible we worked with the businesses to apply our assumptions into the businesses' own electricity models. Where this was not possible, we made a number of broad assumptions regarding the relative split of network, energy and other costs incorporated in the bill.

In contrast, PwC used forecasts of carbon costs and retail prices contained in reports by SKM/MMA. However, we note that the retail prices in the SKM/MMA report for the Victoria medium industrial scenario are very similar to the Procurement Australia energy prices for 2013-14. Where they differ is in the latter years of the regulatory period, as SKM/MMA forecasts real price increases, while the Procurement Australia quote provides for real price decreases in 2014-15 and 2015-16 (and Deloitte has assumed unchanged real prices from this time).

**Table 11 comparison of energy prices (\$/MWh, 01/01/2013)**

	Water Plan forecast				
	2013-14	2014-15	2015-16	2016-17	2017-18
Procurement Australia quote	59.090	57.508	55.969	55.969	55.969
SKM/MMA medium projection (Victoria industrial)	58.815	63.339	59.946	67.863	68.994
SKM/MMA low projection (Victoria industrial)	58.815	63.339	30.538	37.325	36.194

Note: Procurement Australia quote figures assumes 50% peak and 50% off-peak energy and assume 2.75% inflation as per our report for regional businesses. SKM/MMA figures shown in table include 10% retailer margin. Source: SKM/MMA for WSAA, *Energy Price Forecasts 2013 to 2032*, Draft 0.1 1 November 2012.

The following sections consider how the Melbourne Water’s electricity cost forecasts would vary from those proposed by the ESC had the same approach been applied to the forecasts as Deloitte did for the regional businesses. Note that because of different levels of data availability it was not possible to exactly reproduce our regional business approach for Melbourne Water.

## 6. Changes in real energy costs

### The PwC approach

As noted above, PwC recommended that an extra \$16.863m be recovered across WP3, compared to base year 2011-12, as a result of the carbon price. This was calculated by multiplying total usage by an SKM/MMA forecast of the carbon price which was converted to a cost per MWh and then a total increase in costs as follows:

Description	Input:	Unit:	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
SKM carbon price forecast - Medium	Price of carbon	\$/tonne	\$ 22.56	\$ 23.11	\$ 23.72	\$ 20.00	\$ 20.70	\$ 21.42
<b>Input:</b>	<b>Unit:</b>							
Price of carbon	\$/tonne	\$2012-13	\$ 22.92	\$ 23.48	\$ 24.10	\$ 20.32	\$ 21.03	\$ 21.77
Emissions intensity of electricity	tonnes of CO2/MWh		1.15	1.12	1.12	1.10	1.09	1.07
Price of carbon per megawatt hour	\$/MWh	\$2012-13	\$ 26.28	\$ 26.40	\$ 27.08	\$ 22.40	\$ 22.89	\$ 23.29
Usage MWh (all electricity useage, excludes ETP and biogas)			131,839	130,459	139,675	146,883	148,084	126,911
<b>Allowed increase in electricity prices under option 1 - carbon only</b>			<b>\$ 3,444,220</b>	<b>\$ 3,782,977</b>	<b>\$ 3,290,494</b>	<b>\$ 3,389,954</b>	<b>\$ 2,955,372</b>	<b>\$ 16,863,016</b>

Source: PwC unpublished data. Reprinted with permission.

PwC did not include any other forward-looking adjustments for changes in energy prices, however it adjusted base year expenditure to remove the additional costs associated with Melbourne Water’s renewable energy contract. As explained above, the reduction reflected the difference between Melbourne Water’s AGL contract price for energy, and a ‘benchmark’ price for energy. This benchmark was calculated using the AFMA contract rate in 2011-12 (adjusted to 2012-13 dollars) and the actual AGL contract price in 2012-13.

### Melbourne Water approach

We have briefly reviewed Melbourne Water’s response to the Draft Decision on this matter but have some concerns with the manner in Melbourne Water it has calculated the \$5.837m. These include:

- Melbourne Water’s approach uses 2012-13 as the base year for future indexing. This will under-estimate the increase in costs compared to using 2011-12 as the base year. The key reason for this is that 2012-13 already incorporates the carbon price while 2011-12 does not.
- Melbourne Water has used the SKM/MMA retail index for projecting forward. We have contacted SKM/MMA to confirm that this index is a composite that reflects both changes in energy prices as well as network prices.<sup>2</sup>

Therefore we have not reviewed Melbourne Water’s proposal in any detail.

### Deloitte calculation

We have revised the energy cost forecast in line with our approach for the regional businesses. To do so we have:

- Amended the base year adjustment to reflect the fact that the energy prices we have used are slightly lower than those adopted by PwC. To make this adjustment we have subtracted the SKM/MMA carbon price used by PwC from the Procurement Australia retail price, and then multiplied by usage. This results in a base year adjustment (reduction) of \$24.8m across WP3, which is higher than PwC’s adjustment of \$19.3m.
- Accepted the PwC calculations of additional per kWh costs due to the carbon price

<sup>2</sup> Email from Paul Nidras, 31 May 2013.

In our discussions with Melbourne Water it has advised that the total usage figure that it provided to PwC was actually only for its largest 10 sites (approximately 131 GWh), and that actual and forecast total usage is higher (around 153 GWh). Accordingly, we have used the higher figures provided by Melbourne Water, and this is the prime reason why our base year adjustments are higher than those made by PwC. However using this higher figure does not have a significant impact on the aggregate forecasts as the base year adjustments are somewhat counteracted by a higher volume applying to the carbon price.

**Table 12 Adjustments to energy forecasts (\$m, 01/01/2013)**

	Water Plan forecast					Total
	2013-14	2014-15	2015-16	2016-17	2017-18	WP3
Reduced base year energy costs compared to MW proposal	(4.997)	(4.651)	(5.131)	(5.056)	(4.996)	(24.831)
Increased carbon price costs compared to MW proposal	2.426	1.744	1.127	0.260	0.502	6.058

Source: Deloitte calculations, Spreadsheet provided by Tom Walker, PwC, 3 June 2013.

## 7. Changes in network costs (excluding ETP Tertiary)

In its response to the Draft Decision Melbourne Water identified that its original submission, and hence the ESC's Draft Decision, did not provide any allowance for real increases in network costs across the regulatory period. It has sought a 6.5% real increases in network costs in each year from 2011-12 to the end of WP3.

Melbourne Water has indicated that its network costs were \$6.234m in 2011-12 and that the additional network costs across WP3 will be \$9.088m.

Consistent with our approach for the regional businesses, we believe it is reasonable to include network cost increases in the forecasts. We have calculated these increases using some simplifying assumptions and taking into account Melbourne Water's relative weighting of distribution charges across its sites (Melbourne Water is supplied by all 5 Victorian distributors). Our estimate is that these higher network costs will amount to \$ 6.775m across WP3.

**Table 13 Additional network costs (\$m, 01/01/2013)**

	Water Plan forecast					Total
	2013-14	2014-15	2015-16	2016-17	2017-18	WP3
Deloitte calculation	0.629	1.134	1.671	1.671	1.671	6.775

Source: Deloitte calculations

## 8. ETP Tertiary electricity costs

Melbourne Water has not challenged the ESC's decision to reduce electricity costs at ETP by \$0.781m, instead indicating to us that it is satisfied with the Draft Decision outcome. Nevertheless, we have examined electricity costs at ETP for completeness.

### Energy costs

PwC recalculated energy costs at ETP using a price of \$64.66/MWh at ETP in 2013-14, increasing to \$77.91/MWh in 2017-18. These figures are higher than we used in our regional analysis. Noting that Melbourne Water has suggested that energy costs will be 40% peak and 60% off-peak at ETP, recalculating using the Procurement Australia quote would mean a reduction of \$3.726m across WP3 compared to the PwC forecasts (and a reduction of \$4.508m compared to Melbourne Water's original proposal).

**Table 14 Energy costs at ETP (\$m, 01/01/2013)**

	Water Plan forecast					Total
	2013-14	2014-15	2015-16	2016-17	2017-18	WP3
PwC calculation	2.985	3.242	3.080	3.506	3.597	16.410
Deloitte calculation	2.634	2.564	2.495	2.495	2.495	12.684
Deloitte reduction compared to PwC	-0.351	-0.679	-0.585	-1.011	-1.101	-3.726

Source: Spreadsheet provided by Tom Walker, PwC, 3 June 2013; Deloitte calculations.

## Network costs

PwC did not amend Melbourne Water's proposal in respect of network costs at ETP. Melbourne Water assumed that they would increase by CPI. However, as noted above there will be real increases in network prices until 1 January 2016. We have used Melbourne Water's spreadsheet to recalculate network costs reflecting these real increases.

**Table 15 Network costs at ETP (\$m, 01/01/2013)**

	Water Plan forecast					Total
	2013-14	2014-15	2015-16	2016-17	2017-18	WP3
Melbourne Water calculation of ETP network costs	0.839	0.839	0.839	0.839	0.839	4.194
Deloitte calculation of ETP network costs	0.871	0.937	0.971	0.971	0.971	4.721
Deloitte increase compared to Melbourne Water	0.032	0.098	0.132	0.132	0.132	0.527

Source: Melbourne Water spreadsheet provided by Tom Walker, PwC, 3 June 2013; Deloitte calculations.

## 9. Summary and conclusions

Overall, applying the approach adopted by Deloitte in respect of our review of the regional businesses results in a very similar outcome to that proposed by PwC and applied by the ESC in its Draft Decision. Additional reductions we have suggested in respect of energy costs are offset by increases in network costs. Our calculations suggest a reduction of \$15.979m compared to Melbourne Water's proposal rather than a \$15.778m reduction as per the Draft Decision – a difference of just \$0.192m.

**Table 16 Summary of adjustments to Melbourne Water electricity forecast (\$m, 01/01/2013)**

	Water Plan forecast					Total
	2013-14	2014-15	2015-16	2016-17	2017-18	WP3
Reduced energy costs at ETP compared to MW proposal	(1.177)	(1.048)	(0.945)	(0.751)	(0.587)	(4.508)
Additional network costs at ETP compared to MW proposal	0.032	0.098	0.132	0.132	0.132	0.527
Additional network costs elsewhere compared to MW proposal	0.629	1.134	1.671	1.671	1.671	6.775
Reduced base year costs due to renewable contract compared to MW proposal	(4.997)	(4.651)	(5.131)	(5.056)	(4.996)	(24.831)
Increased carbon price costs compared to MW proposal	2.426	1.744	1.127	0.260	0.502	6.058
<b>Total reduction using Deloitte approach</b>	<b>(3.087)</b>	<b>(2.723)</b>	<b>(3.146)</b>	<b>(3.745)</b>	<b>(3.278)</b>	<b>(15.979)</b>
Total reductions in Draft Decision	(2.786)	(2.806)	(3.221)	(3.474)	(3.502)	(15.788)
<b>Net change using Deloitte approach compared to Draft Decision</b>	<b>(0.302)</b>	<b>0.084</b>	<b>0.074</b>	<b>(0.271)</b>	<b>0.224</b>	<b>(0.192)</b>

Source: Deloitte calculations.

I would like to acknowledge the assistance of Tom Walker from PwC in providing information and models to explain the approach adopted by Melbourne Water and the PwC approach, as well as assistance provided by Cameron Stewart from Melbourne Water.

Yours sincerely

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Deloitte Touche Tohmatsu

### **General use restriction**

This advice is prepared solely for the use of the Essential Services Commission. The advice is not intended to and should not be used or relied upon by anyone else and we accept no duty of care to any other person or entity. The advice has been prepared for the purpose of the Essential Services Commission's 2013 price review. You should not refer to or use our name or the advice for any other purpose.