



ENERGY AND NATURAL RESOURCES

Water Services Corporation

Water tariffs

10 December 2009

ADVISORY

Important information relating to this deliverable

This deliverable is addressed to Water Services Corporation (the Corporation) and has been prepared in accordance with our terms of engagement dated 14 April 2009.

Our duties in relation to this deliverable are owed solely to the Corporation and accordingly we do not accept any responsibility for loss occasioned to any third party acting or refraining from action as a result of this deliverable. We understand that this document may be provided to third parties including the general public as part of a public consultation process. We have given our consent for this document to be copied or disclosed to such third parties on the basis that we do not owe such third parties any duty of care as a result of giving such consent.

We have indicated in this deliverable the sources of information presented. We have not sought to establish the reliability of those sources.

The scope of our work was different from that for an audit and, consequently, we do not issue any opinion or any other certificate or confirmation relating to the financial statements, tax position or the internal control systems of Water Services Corporation.

Our deliverable makes reference to “KPMG analysis”; this indicates only that we have (where specified) undertaken certain analytical activities on the underlying data to arrive at the information presented; we do not accept responsibility for the underlying data.

In carrying out our work, we have relied on information obtained from parties not employed by us and this information has been assumed to be true and correct. We have for the most part based our work on information, including audited and unaudited financial information, relating to the Corporation. We do not accept responsibility for such information which remains the responsibility of the Corporation. We have not sought to establish the reliability of this information by reference to sources independent of the Corporation. Our reliance on and the use of this unaudited information should not be construed as an expression of our opinion on it. We do not accept any responsibility or liability for the impact on our analysis and conclusions of any inaccuracies in such information.

This deliverable, including the underlying consumption and tariff simulation models, include certain statements and estimates with respect to the Corporation’s business. Such statements and estimates reflect various assumptions made by the Corporation which assumptions may or may not prove to be correct. No representation is made as to the accuracy of such statements and estimates.

In compiling this deliverable, we have relied on Water Services Corporation’s estimates for 2010, based on the Corporation’s assumptions related to the nature and size of the intended level of operations. There will usually be variances between projected and actual results, because events and circumstances frequently do not occur as expected and these variances may be material.

We have asked the Corporation to review the factual information contained in this deliverable and obtained their confirmation on the veracity of this information and that no other essential information has been withheld from us.

The analysis set out in this deliverable takes into account all the information known and made available to us up to the time of its preparation and is therefore current as at the document date, or such other date that may be specified.

Objectives definition

Terms of reference

- **We were asked to:**

- analyse the available unbundled data in the Corporation's financial information, including costs related to potable water and wastewater operations
- review the current applicable potable water consumption tariff mechanism and to compute water retail tariffs (limited only to a revision of variable consumption tariffs) based on the cost data available
- assess various options with regard to tariff structures and underlying principles, and to facilitate the consideration of various alternatives and options by the Corporation

Objectives definition

Sources of information

- **The information and data set out in this document have been sourced as follows:**
 - financial information including Recurrent and Capital Expenditure Estimates January to December 2010 dated 14 September 2009, sourced from the Corporation
 - other information sourced from key management executives of the Corporation
 - an updated profile, as at May 2009, of Residential and Non-Residential customer accounts and their respective average consumptions generated by MITA from the WSC billing system and revised by the Corporation
- **This deliverable takes into consideration all relevant information, data and statistics made available to us by close of business on 13 November 2009, and subsequent communications from the Malta Resources Authority**

Objectives definition

Assumptions

- **The key assumptions underlying this analysis have been adopted by the Water Services Corporation and include**
 - the Corporation's cost estimates for the year 2010
 - Government retaining its contribution towards the Corporation by way of a subvention
 - an anticipated increase in the cost of electricity, the cost of which was based on Enemalta Corporation agreeing to treat the Corporations' electricity accounts as a single grouped account, applicable only to the cumulative consumption for billing purposes
 - a Return on capital employed (ROCE) calculation limited to recover interest on the Corporation's existing debt

Water Services Corporation CUSTOMER PROFILES

Water Services Corporation

Residential customer profile

Consumption Range	Number of Persons											Total
	0	1	2	3	4	5	6	7	8	9	10	
= 0	18,141	1,464	553	209	179	59	17	2	-	1	3	20,628
> 0 and <= 33	41,871	12,726	9,236	3,481	1,974	486	117	34	6	2	2	69,935
>33 and <= 66	10,016	5,377	13,640	8,391	5,102	1,227	257	46	6	2	8	44,072
>66 and <= 99	4,333	1,413	7,127	9,334	8,031	2,035	397	91	25	4	3	32,793
>99 and <= 132	1,882	529	2,402	5,424	6,936	2,335	567	129	30	9	4	20,247
>132 and <= 165	812	214	798	2,182	4,191	1,870	506	131	31	5	3	10,743
>165 and <= 231	623	132	417	1,136	2,681	1,809	655	161	56	8	5	7,683
>231 and <= 297	224	33	88	198	437	434	197	83	29	11	15	1,749
>297 and <= 363	83	20	28	52	99	92	64	31	19	5	4	497
>363 and <= 2,400	160	22	34	43	62	67	43	20	12	9	36	508
>2,400 and <= 6,800	5	-	-	-	-	-	-	-	-	-	6	11
>6,800	-	-	-	-	-	-	-	-	-	-	-	-
	78,150	21,930	34,323	30,450	29,692	10,414	2,820	728	214	56	89	208,866

Consumption Range	Average consumption										
	0	1	2	3	4	5	6	7	8	9	10
= 0	-	-	-	-	-	-	-	-	-	-	-
> 0 and <= 33	10.67	17.01	20.50	21.14	20.70	21.06	20.59	20.24	19.67	23.00	11.00
>33 and <= 66	47.70	46.15	49.32	51.38	51.95	52.20	52.88	53.46	53.33	56.50	51.25
>66 and <= 99	80.64	80.08	80.39	82.24	83.86	83.98	82.89	82.47	86.28	91.50	83.00
>99 and <= 132	113.80	112.99	112.86	113.73	115.08	115.32	116.36	116.19	112.83	119.00	116.00
>132 and <= 165	146.74	147.73	146.90	146.20	147.00	148.02	148.59	148.82	148.03	145.60	155.33
>165 and <= 231	191.89	192.52	191.22	188.36	189.32	190.65	194.11	195.48	194.21	195.13	200.00
>231 and <= 297	258.45	256.94	259.41	253.62	256.89	257.72	255.13	263.16	261.72	261.00	256.07
>297 and <= 363	323.80	330.35	323.86	327.25	324.52	323.61	324.59	323.23	330.58	324.60	339.50
>363 and <= 2,400	630.18	672.27	584.32	584.70	542.98	503.82	503.84	495.00	498.75	562.44	815.03
>2,400 and <= 6,800	3,685.00	-	-	-	-	-	-	-	-	-	3,316.00
>6,800	-	-	-	-	-	-	-	-	-	-	-

Water Services Corporation

Non-Residential customer profile

Number of Accounts	
Consumption Range	Total
= 0	3,134
> 0 and <= 33	22,089
>33 and <= 66	3,045
>66 and <= 99	1,568
>99 and <= 132	996
>132 and <= 165	694
>165 and <= 231	797
>231 and <= 297	485
>297 and <= 363	313
>363 and <= 2,400	1,333
>2,400 and <= 6,800	207
>6,800 and <=25,000	72
>25,000 and <=40,000	11
>40,000	16
	34,760

Average consumption	
Consumption Range	
= 0	-
> 0 and <= 33	8.08
>33 and <= 66	47.97
>66 and <= 99	82.18
>99 and <= 132	114.43
>132 and <= 165	148.14
>165 and <= 231	194.23
>231 and <= 297	260.12
>297 and <= 363	327.11
>363 and <= 2,400	842.64
>2,400 and <= 6,800	3,954.72
>6,800 and <=25,000	12,418.29
>25,000 and <=40,000	33,360.00
>40,000	82,652.81

Water Services Corporation

Changes in consumer profile

Consumer profiles		
	Current Tariff	2010 Tariff
Number of accounts		
Residential	199,409	130,716
Domestic		78,150
Non-Residential	43,059	34,760
Total	242,468	243,626
	m³	m³
Consumption		
Residential	12,136,232	10,224,700
Domestic		1,930,717
Non-Residential	5,364,942	5,578,877
Total	17,501,174	17,734,294
Source: WSC information, KPMG analysis		

Water Services Corporation

REVISED RETAIL TARIFFS

Tariff parameters

Water

Tariff parameters

- **Introduce the new category of "Domestic accounts" so that there will now be three categories of accounts:**
 - Residential accounts – at least one person is registered as living in the premises
 - Domestic accounts – formerly included under the Residential category and comprising garages, common parts of apartments and similar premises where no persons are registered as residing therein (NOP=0)
 - this category excludes those premises being used for commercial or social activities which have now been included under the Non-Residential category
 - a Domestic account becomes a Residential account as soon as a person is registered as resident in the premises provided that the same person is not registered anywhere else
 - Non-Residential accounts – used for commercial (business, industry, offices) or social activities (clubs, churches, institutes)
 - premises that are used for social activities such as churches and clubs together with institutions such as homes for the elderly, homes for persons with special needs, as well as not-for-profit schools and similar premises, are being classified as Non-Residential

Water

Tariff parameters

- **The installation and annual service charge rates are to be maintained at the current rates. However, €20 per account from the annual service charge is to be deemed by the Corporation to be covering wastewater costs**
 - there is no effect on the charge paid by the account holder
- **The proposed consumption tariffs recover the Corporation's full cost less the Government subvention**
 - Residential
 - maintain the current two-tier tariff structure and the current 'reduced tariff' consumption threshold of 33m³ per person per annum
 - Non-Residential
 - maintain the current three-tier tariff structure with the following current consumption thresholds:
 - *Tier 1 168m³ per annum*
 - *Tier 2 additional 39,832m³ per annum*
 - *Tier 3 any remaining consumption above 40,000m³*

Water

REVISED RETAIL TARIFFS

Cost analysis

Water

Cost analysis

- Total cost to be recoverable through tariffs (fixed charges supplemented by a variable charge) and a government subvention

Water Services Corporation	
Full Cost Recovery	2010 Estimates €
Production costs	19,643,440
Distribution costs	14,195,308
Wastewater costs	15,919,867
Administration costs	19,504,203
ROCE	3,794,356
Total Costs	73,057,173
Government subvention	(14,176,000)
Costs to be recovered through tariffs	58,881,173
Source: KPMG analysis	

Water

Cost analysis

- The capital charge (ROCE) included in the current version of the tariffs has been restricted to the recovery of interest payments on debt (see table below)

Capital charge included in proposed water tariffs

Interest cost on estimated average debt in 2010 (€)	3,794,356
Capital employed (€)	152,175,586
Implied return on capital employed	2.5%

- Based on the above approach the total capital charge (or “ROCE”) included in the proposed tariffs set out in this document is of €3.8 million and based on total capital employed of €152 million, the implied WACC is of 2.5%

- In Appendix 1 we present the Weighted Average Cost of Capital approach to calculating the capital charge (ROCE). This alternative methodology is often adopted by regulators in establishing tariffs
- The pre-tax WACC calculated on this basis ranges between 8.59% to 8.71%. This exceeds the implied return in the capital charge of 2.5% as included in the tariff computations

Water PROPOSED TARIFFS

Water

Residential

- Retention of two-tier tariff mechanism, maintaining the current 'reduced tariff' consumption threshold for the initial 33m³ per person per annum
- Variable costs are recoverable through a variable tariff charge as shown below

Residential tariff structure (NOP>0)			
Consumption band	m ³	Current € / m ³	Proposed € / m ³
1 st tier	≤ 33m ³	1.40	1.47
2 nd tier	> 33m ³	5.15	5.41

Water

Domestic

- Retention of two-tier tariff mechanism, maintaining the current consumption threshold of 33m³ per account per annum
 - this is set at a higher rate than the Residential 1st tier rate

Domestic tariff structure (NOP=0)			
Consumption band	m ³	Current € / m ³	Proposed € / m ³
1 st tier	<= 33m ³	2.00	2.30
2 nd tier	> 33m ³	5.15	5.41

Water

Non-residential

- The variable tariff maintains the current three-tier tariff structure with the following consumption thresholds
 - initial 168m³ per annum is charged at a reduced rate
 - the next 39,832m³ per annum is charged at a peak rate
 - any remaining consumption above 40,000m³ charged at an intermediate rate

Non-residential tariff structure			
Consumption band	m ³	Current € / m ³	Proposed € / m ³
1 st tier	<= 168m ³	1.75	2.10
2 nd tier	>168m ³ and <=40,000m ³	2.15	2.50
3 rd tier	> 40,000m ³	1.40	1.75

Water

APPENDIX 1

Weighted Average Cost of Capital

Appendix 1 – WACC for water tariffs

The WACC equation

- The Weighted Average Cost of Capital incorporates the two main types of finance used to fund the capital employed by the business to carry out its operations, namely debt and equity
 - WACC is estimated on the basis of market variables and employs approaches, such as the Capital Asset Pricing Model (CAPM), which are well grounded in finance theory and relatively straightforward to apply in practice
 - Using a market approach involves the use of financial market data for comparator companies instead of data relating to the company's own capital structure and cost of finance. This will ensure that the cost of capital is set at an efficient level reflecting the underlying market cost of raising finance
 - The required WACC has to be calculated pre-tax as applying a post-tax rate would double count tax
- Pre-tax WACC =**
- the cost of debt multiplied by the proportion of the total capital employed financed through debt
 - plus*
 - the pre-tax cost of equity multiplied by the proportion of the total capital employed financed through equity
- Capital employed = debt + equity**
- The pre-tax cost of equity =**
- The cost of equity (post-tax)
 - divided by*
 - (1 minus the corporate tax rate)
- The main parameters in finding WACC therefore are:**
- A market based cost of debt
 - The cost of equity
 - The assumed capital structure (based on market data)
 - The applicable tax rate

Appendix 1 – WACC for water tariffs

The assumed capital structure

- Regulators typically would not use the actual capital structure of regulated entities but rather a market based capital structure designed to reduce the cost of capital to a minimum
- The Malta Communications Authority (MCA) puts this imperative as follows:

“Theoretically, a forward looking WACC should be based on the estimated optimal capital structure over the period of the regulation, as opposed to the existing capital structure of a company. An optimal gearing ratio makes full use of the tax advantages of debt while keeping default risk at levels acceptable to shareholders.”
- The MCA further states that the argument for using an optimal capital structure is further strengthened by the fact that the regulatory WACC is used to provide the operator with a reasonable rate of return on a regulated basis, assuming an efficient gearing structure
- The MCA further states that in view of the difficulties encountered in establishing a single, optimal gearing ratio, a range of gearing ratios should be considered.
- For the purposes of our analysis we have calculated WACC using the following capital structure assumptions:
 - a debt to equity ratio of 150% (representing a gearing ratio, that is debt to debt plus equity, of 60%). This is very close to the average European water utilities gearing ratio of just under 58%
 - a more conservative debt to equity ratio of 100% (gearing of 50%)

Appendix 1 – WACC for water tariffs

The cost of equity

- The cost of equity is estimated using the Capital Asset Pricing Model (CAPM):
Cost of equity = Risk-free rate + (Market equity risk premium x Beta)
 $K_e = R_{fr} + (MRP \times \beta)$
- CAPM measures risk in terms of non-diversifiable variance, and relates expected returns to this risk measure. It is based on several assumptions including that investors are rational and risk averse, that they have homogenous expectations about asset returns and variances; that investors can borrow and lend at a risk-free rate; that all assets are marketable and perfectly divisible; that there are no transaction costs; and that there is no restriction on short sales
- One further consideration relates to the fact that CAPM tends to underestimate the cost of equity of smaller firms. For this reason some argue that the cost of equity of smaller firms should be estimated after including a small-equity premium
 $K_e = R_{fr} + (MRP \times \beta) + SP$
- An analysis of recent literature on this issue reveals that the small equity premium does not seem to have any good statistical support and appears incompatible with the broad thrust of modern corporate finance theory. We have therefore excluded this from our analysis of the cost of equity

Appendix 1 – WACC for water tariffs

The cost of equity

Risk-free rate (Rfr)

- The risk-free rate is the interest rate that can be obtained by investing in financial instruments with no default risk
- A 'risk-free' asset is in essence a theoretical notion. In practice the norm is to use ten year government bonds of the currency in question
- We have used the German 10-year government bonds as a benchmark for the risk-free rate. The German 10-year government bonds' average yield as at 5 November 2009 was of **3.34%**

Market equity risk premium (MRP)

- The market equity risk premium is the difference between the average returns on equities in the market as a whole and the average returns on risk-free securities. It compensates for the market equity risk and the underlying country risk
- Research has indicated that the current risk premium for a mature equity market is of 5.00% (based on Damodaran's data for January 2009). Given Malta's government bond rating, which as at January 2009 stood at A1 (Moody's), Damodaran has attributed a country risk premium of 2.10% resulting in an Equity Risk Premium of **7.10%**

Appendix 1 – WACC for water tariffs

The cost of equity

Estimating the Unlevered Beta (β_u)

- Betas for Maltese equities are not available. To estimate the unlevered Beta (that is the Beta assuming there is no debt) for the purposes on water tariffs, we have referred to Beta information on the water sector in Europe. Average industry Betas are computed by reference to a number of companies listed in European equity markets. We have taken this information from Damodaran's analysis as of January 2009, based on the data from 12 European water utilities. The unlevered Beta is of **0.33**

Estimating the levered Beta (β_l)

- The unlevered Beta is then re-levered to take into account the estimated debt to equity ratio for that business. The formula we have used for this purpose (based on the Damodaran approach) is as follows:

$$\beta_l = \beta_u + (\text{Debt/Equity} \times \beta_u \times (1 - \text{tax rate}))$$

Pre-tax cost of equity

- The table below sets out the calculation of the estimated pre-tax cost of equity

Cost of equity		
Debt to equity ratio	1.50	1.00
Gearing (debt/(debt + equity))	0.60	0.50
Tax rate	35.0%	35.0%
Risk free rate	3.34%	3.34%
Market equity premium	7.10%	7.10%
Unlevered Beta	0.33	0.33
Levered Beta	0.65	0.54
Equity risk premium	4.63%	3.87%
Cost of post-tax equity	7.97%	7.21%
Cost pre-tax equity	12.26%	11.09%

Appendix 1 – WACC for water tariffs

The cost of debt

Cost of debt
= Risk free
cost of debt +
risk premium

Linking gearing, rating and debt risk premium

- The market debt premium is heavily influenced by the rating attached to the debt
- Debt ratings are in turn heavily influenced by the level of gearing. The MCA quotes a study by WIK Consult converting the level of debt into an associated rating. This is shown in the table below together with the associated debt risk premium indicated by Damodaran at 1 January 2009

Debt as a % of capital employed	Rating (S&P)	Risk premium (1 Jan 2009)
75.0%	B-	15.5%
68.8%	B	12.5%
62.5%	B+	11.5%
56.3%	BB	10.5%
50.0%	BBB	5.8%
40.0%	A-	3.8%
30.0%	A	3.5%
25.0%	A+	3.3%
20.0%	AA	2.5%
10.0%	AAA	2.0%

WSC's cost of debt

- WSC's current weighted average cost of debt is in the region of 3%. This rate is heavily influenced by the fact that Government currently guarantees the Corporation's debt and, to a lesser degree, as most of this debt is based on variable interest rates
 - Clearly given the guarantees provided by government, this debt is quasi-equity and the cost of debt should be increased by government's "cost" of providing this significant support. Using a market related cost of debt, in line with sound regulatory practice, avoids the necessary adjustments that will be required to properly reflect this
- Assuming that WSC would be rated at the same level as Enemalta, that is at BB+ (S&P, 16 October 2009), reflecting the 100% ownership and support by government and assuming a very high likelihood of extraordinary government support in the event of financial distress, WSC's cost of debt would carry a debt risk premium of 9.5% (Damodaran, Jan 2009). This would result in a cost of debt for WSC of 12.84%

Appendix 1 – WACC for water tariffs

The cost of debt

Based on the local capital market

- Irrespective of the risk premium attached to debt issued internationally, in Malta the returns required by bond holders have been significantly lower irrespective of the fact that bonds issued were unrated.
- As already stated, we use the ten year German government bond rate (3.34% at 5 November 2009) as the estimate of the risk free rate
- Government has this week issued ten year bonds with a coupon of 4.60%. This suggests a country risk premium for debt in Malta of 126 basis points
- Clearly, commercial debt requires a further risk premium over sovereign debt
- To estimate this additional premium we have taken the yield to maturity at 11 November 2009, of local corporate bonds listed on the Malta Stock Exchange with maturities of between 6 to 10 years and computed the risk premium over and above the coupon on ten year government paper of 4.6%. A simple average results in a premium of 162 basis points, and a premium of just over 150 basis points when eliminating the two outliers in the data set.
- We estimate that based on a gearing ratio of between 40% to 50%, an additional debt risk premium of 1.5% would be appropriate. We have added a further premium of 0.25% in the case of a gearing ratio of 60%. The resulting cost of debt for each of the capital structure scenarios we consider, is shown in the table below:

Cost of debt		
Debt to equity ratio	1.50	1.00
Gearing (debt/(debt + equity))	0.60	0.50
Risk free rate	3.34%	3.34%
Country risk premium	1.26%	1.26%
Ten year government debt (Nov 09)	4.60%	4.60%
Additional risk premium	1.75%	1.50%
Estimated cost of debt	6.35%	6.10%

Appendix 1 – WACC for water tariffs

Estimate of pre-tax WACC

Pre-tax WACC

Pre-tax Weighted Average Cost of Capital (WACC)		
Debt to equity ratio	1.50	1.00
Gearing (debt/(debt + equity))	0.60	0.50
Equity to debt + equity	0.40	0.50
Cost of debt	6.35%	6.10%
Cost of equity	12.26%	11.09%
Pre-tax WACC	8.71%	8.59%

- The pre-tax WACC calculated on this basis ranges between 8.59% to 8.71%. This exceeds the implied return in the capital charge of 2.5% (€3.8 million capital charge as a percentage of €152 million capital employed) as included in the tariff computations