Veolia Water – The Operator

For a century and a half municipalities around the world have trusted Veolia Water to help them provide their communities with high quality water and wastewater services. Over the last ten years our international business has grown to respond to the needs of municipalities with water stress due population growth from urbanization as well as droughts as the climate continues to change around the world.

This water stress has driven the growth of the desalination business in the last two years: with all the applications from seawater with membrane and thermal technologies, brackish water and water reuse, it has resulted in four companies winning 40% of the international market with Veolia Water winning the largest share at 19% [1]

The highly specialized skills of operating all the different types of water services have been continually developed since Veolia Water’s first contract in 1853. This knowledge is now helping over 8000 municipalities in 65 countries and depends on the skills of over 77,000 employees. These contracts are often partnerships so that our technical and operational know-how can be tailored to add real value to our partner’s expertise.

The goal is to help our partners and the municipalities to prepare for the future, build the water services for tomorrow and transfer knowledge while helping to operate the services on a long term basis.

Membrane Solutions

Veolia Water has been heavily involved with membrane solutions for more than 30 years. This experience includes research, design, build and operation services in most parts of the world with most types of membrane technology.

Membrane technology has become one of the fastest growing segments of the water industry with annual growth rates between 11% for reverse osmosis (RO) and 35% for ultrafiltration and microfiltration between 1999 and 2002. Part of the reason for the RO growth is that the cost of an RO element has dropped in price by over 90% since 1980.

Approximately 27 times more water can be produced for the same unit capital membrane cost compared to 1980.[2] The benefits of other types of membranes for RO pretreatment, reclamation of wastewater and membrane bioreactors for wastewater treatment for reuse is now adding to the expansion of this market.

Veolia Water membrane experience through design build and operating contracts includes:

Seawater desalination

Multiple operating contracts in the Caribbean and Mediterranean and design build contracts internationally
Wastewater desalination for reuse

Large scale design build and operating contract in USA (Honouliuli (MFRO)), Australia (Kwinana, Illawara (MFRO) and Gerringong (MF)), Singapore (Kranji (MFRO)) and China (Tianjin (MFRO)).

Potable water treatment

Large scale membrane projects in France with Mery sur Oise (NF), UK with Clay Lane (UF) and Chertsey (MF), Namibia with Windhoek (UF), and Australia with Bendigo (MF).

Ashkelon Project

Veolia Water is one of the partners in the Ashkelon Build, Operate and Transfer Project which consists of the financing, design, construction, operation and transfer of a sea-water desalination plant with guaranteed production capacity of up to 100,000,000 m$^3$/year. This plant will be located at the Ashkelon site of the Eilat-Ashkelon Pipeline Corporation, 30 kms south of Tel-Aviv.

The design of the Plant is such that it enables an extension of the production capacity during the operating phase of the Project. In addition, the initial annual production capacity exceeds by 10 million m$^3$ the required guaranteed annual production capacity of 100 million m$^3$ in order to allow for some flexibility in the production levels, should the Client decide to purchase more desalinated water from VID or allow VID to produce Excess Quantities.

The Plant is designed, constructed and will be operated by a Consortium made up of three international Sponsors, who have created a special purpose company, V.I.D. Desalination Company Ltd. (the "SPC" or "VID") in order to carry out the Project. The companies and their respective initial participation in the SPC’s share capital are the following:

**VID desalination Company Limited (SPC, Special Purpose Company)**

IDE Technologies Ltd. 50%
Veolia Water 25%
Elran (D.D.) Infrastructures Ltd 25%

**EPC, Engineering procurement and construction contractor named OTID**

OTV Veolia Water 50%
IDE Technologies Ltd. 50%

**ADOM, The Operation and maintenance company formed for the project includes**

Veolia Water 49.5%
IDE Technologies Ltd. 40.5%
Elran (D.D.) Infrastructures Ltd 10%

The Project is governed by a Build, Operate and Transfer Agreement ("the Agreement") entered into between the Consortium and a government agency, the Water and Desalination...
Authority (“WDA”) of Israel. The Agreement has been awarded for a period of 24 years and 11 months from the Effective Date, i.e., 20th August 2002. The production of the Plant will be sold to the WDA, whose obligations (incl. payment obligations) under the Agreement are deemed to be obligations of the State of Israel.

Operating and Maintenance Costs (O&M costs)
The total sale price of 0.527 US$/m$^3$ is composed for as follows

- 58% of the price per m$^3$ is the fixed component to cover capital expenditure, fixed operating and maintenance costs and part of the profit and is index linked to various currencies.
- 42% of the price per m$^3$ is the variable component to cover energy and variable O&M costs, membranes, chemical costs and part of the profit. The costs are indexed to oil and electricity prices as well as currency exchange rates.

The table below gives a breakdown of the costs associated with the contract.

<table>
<thead>
<tr>
<th>Organization</th>
<th>Component</th>
<th>First 5 years</th>
<th>Subsequent years</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPP (Independent Power Purchase)</td>
<td>Energy</td>
<td>0.141</td>
<td>0.141</td>
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<tr>
<td>ADOM</td>
<td>Chemicals</td>
<td>0.038</td>
<td>0.038</td>
</tr>
<tr>
<td>ADOM</td>
<td>Membranes</td>
<td>0.021</td>
<td>0.042</td>
</tr>
<tr>
<td>ADOM</td>
<td>maintenance</td>
<td>0.025</td>
<td>0.058</td>
</tr>
<tr>
<td>ADOM</td>
<td>labour</td>
<td>0.027</td>
<td>0.027</td>
</tr>
<tr>
<td>ADOM</td>
<td>Various O&amp;M</td>
<td>0.009</td>
<td>0.009</td>
</tr>
<tr>
<td>VID</td>
<td>Various SPC</td>
<td>0.016</td>
<td>0.016</td>
</tr>
<tr>
<td>total</td>
<td></td>
<td>0.277</td>
<td>0.331</td>
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</tbody>
</table>

Notes
1. The energy from gas turbine is produced on site by Mishor Rotem – Delek Energy Limited Partnership based on consumption of 3.88 kWh/m$^3$
2. The chemical include sulphuric acid and sodium hydroxide for pH adjustment, antiscalants, limestone for remineralisation, flocculants and disinfectants
3. Membranes costs are based on 13% renewal rate per year
4. VID Various SPC includes local tax., land and buildings, security and administrative costs (staff, insurance …)

The operator will have 2 majors roles
- perform its contractual commitment towards SPC who pays for energy, to keep energy consumption
- deliver required water quantities, compliant with the required quality standards while mastering its own costs
The table below shows the weight of each cost factor: it appears clearly the growing importance of membrane and maintenance costs. These renewal costs have been profiled over the time to reach a competitive water tariff at bid submission.

<table>
<thead>
<tr>
<th></th>
<th>First 5 years</th>
<th>Subsequent years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemicals</td>
<td>25%</td>
<td>22%</td>
</tr>
<tr>
<td>Membranes</td>
<td>19%</td>
<td>24%</td>
</tr>
<tr>
<td>Maintenance</td>
<td>23%</td>
<td>33%</td>
</tr>
<tr>
<td>Labour</td>
<td>25%</td>
<td>16%</td>
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<tr>
<td>Various (insurance…)</td>
<td>8%</td>
<td>5%</td>
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<tr>
<td>Total</td>
<td>0.110</td>
<td>0.174</td>
</tr>
</tbody>
</table>

in USD 2002 per m3 in USD 2002 per m3

References

[1] Desalination and Water Reuse, IDA Volume 14/No4 2004 Robin Wiseman