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Waste Water Treatment: the Milan metropolitan area case

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Overview

- Current developments in water legislation at the national and regional level;
- An economic and financial analysis about a waste water treatment plant in Milan metropolitan;
- The estimation of the integrated water system tariff.

Context and framework: National level

- **1994: Law Galli**

- Main goal: to reduce the fragmentation of the organisational framework by the concession of the entire Integrated Water Service Management (IWSM).
- Public authorities were in charge of the planning and regulation, whereas specialised companies had to provide management and investment.

Context and framework: National level

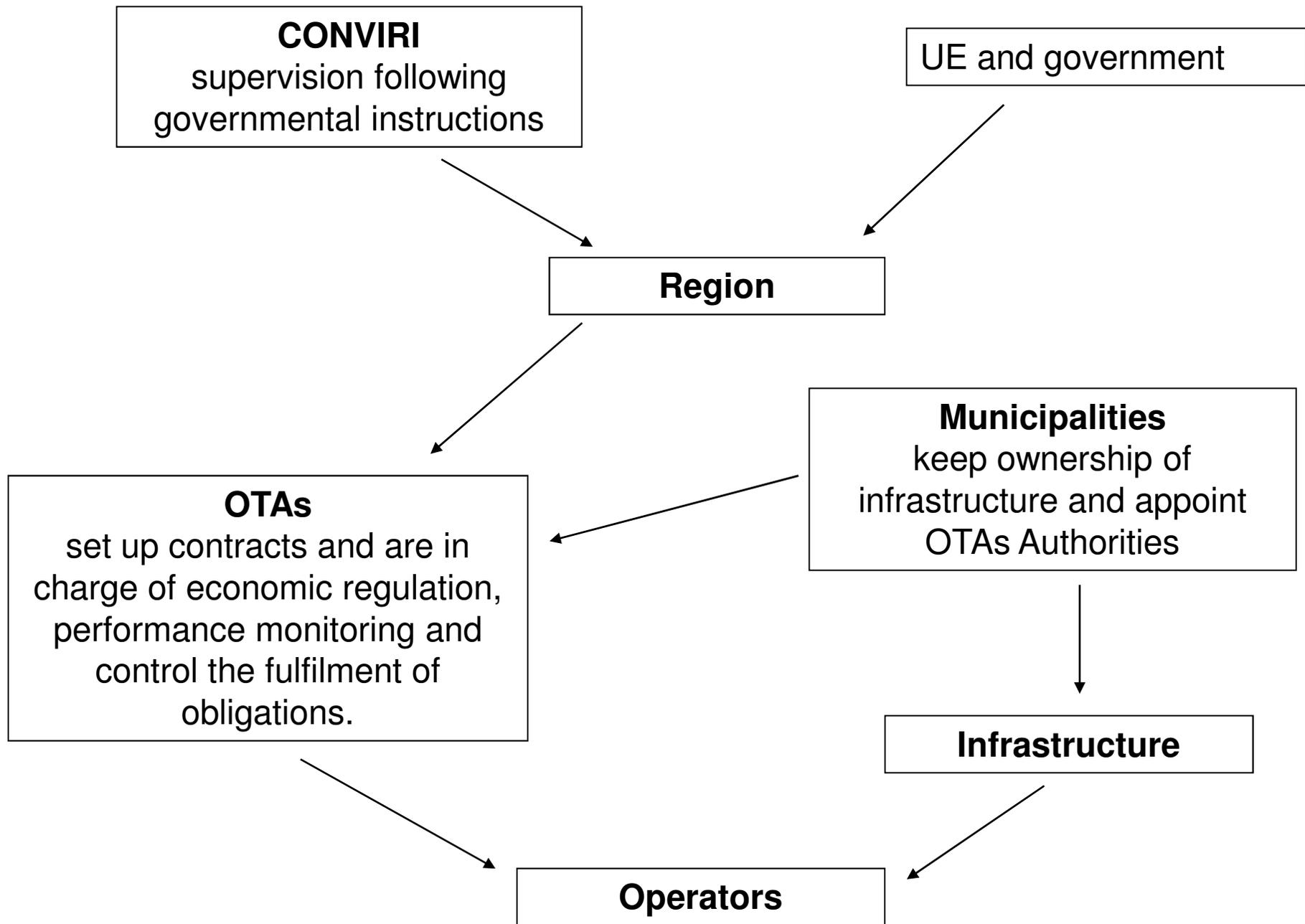
- Water management had to aim to full- cost recovery by applying tariffs that can cover the overall costs of entrepreneurial risks;
- Water infrastructure management was put under the single control of the Basin Authority;
- Optimal Territorial Areas (OTAs): specific relevant areas for the operation of water services. Regional authorities had jurisdiction over these areas.

Context and framework: National level

- **D.I. 112/2008 and D.I. 135/09**

Three ways according to which the service can be tendered:

1. to any kind of company by a public tendering in order to choose the most efficient provider;
2. a public – private partnership in which the private is chosen by a public tendering;
3. in-house providing when the first two options are not possible with the permission of the Antitrust authority.



Context and framework: Regional level

- **Lombardy Water Act** (l.r. Lombardia 26/2003 as modified by l.r. Lombardia 1/2009);
- “**ATO Città di Milano**”: occupies a surface of 18200 Ha and serves 2.3 million of inhabitants;
- The current tariff for the Integrated Water Service amounts to 0.54€/m³, of which 0.25€/m³ is dedicated to sewage treatment.

Methodology and analysis

- Necessity to cover 20 per cent of the population with a new plant situated in Sesto Ulteriano;
- The stakeholders can be divided into four groups:
 - **Municipality of Milan**: owner of the infrastructures
 - “**ATO Città di Milano**”, the local regulator agency, responsible for the control of the service
 - “**MM**”, Metropolitane Milanesi, the service provider
 - **Final users**

Methodology and analysis

- The tariff is set according to the Italian legislation:

$$T_n = (C + A + R)_{n-1} (1 + P + K)$$

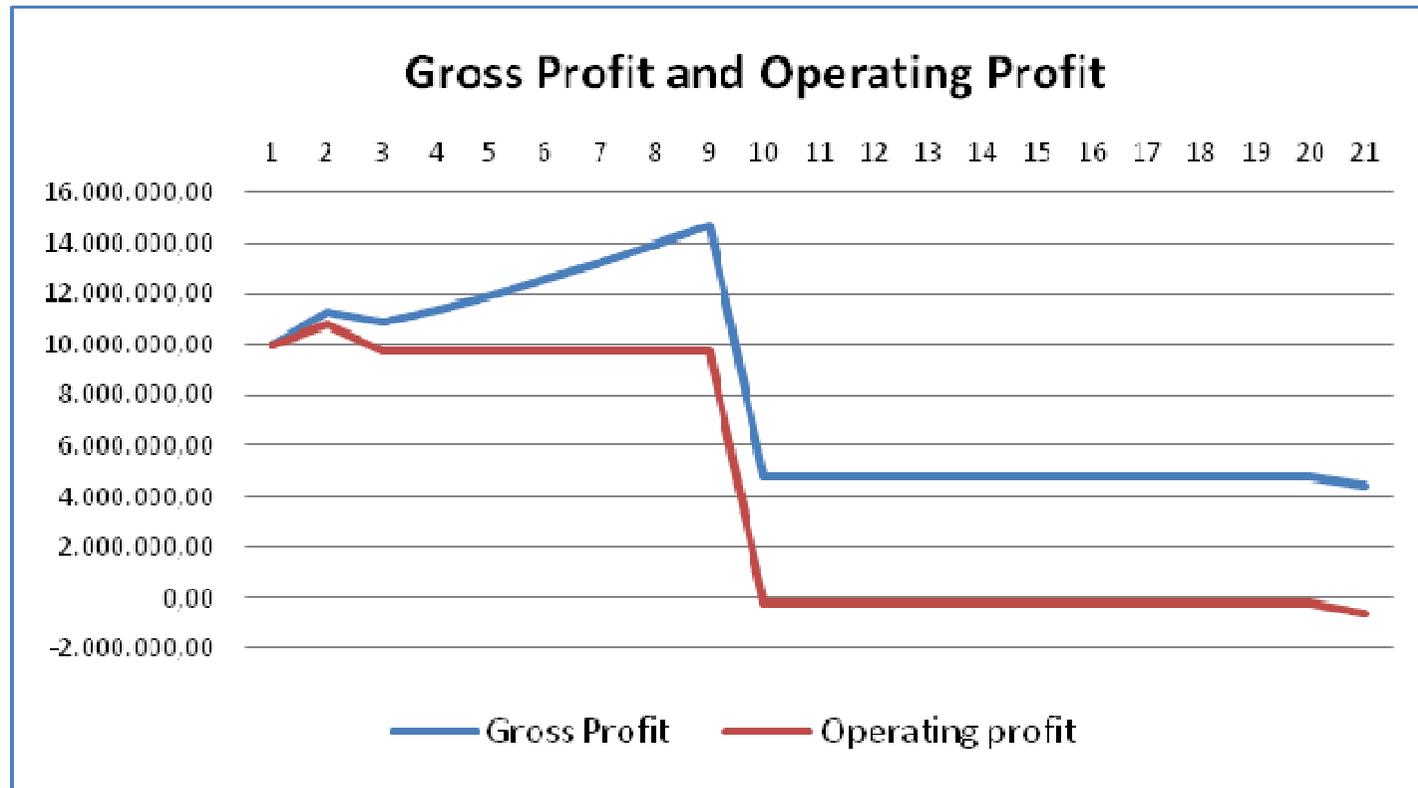
Methodology and analysis

Water water treated on year 0 (mil. m3)	55.6
Revenues from waste water treatment (mil. Euro)	13
Other Revenues	0.8
Cost of employees	3.5
Cost of raw material and goods	0.65
Cost of concession to the City of Milan	5
Cost of Electricity	4
Cost of rigeneration active carbon	1
Cost of insurance	0.5
Cost of waste disposal	1
Operating costs	12.15
Gross Profit	-1.85
Depreciation	0
Operating profit	-1.85
Financial Expenses	3.645
Profit (loss) before taxation	-5.495
Taxation	-1.51113
Profit (loss) after taxation	-3.98388
A.E. / year(cubic meters per year)	500,000
State Grant (mil. Euro)	8

Methodology and analysis

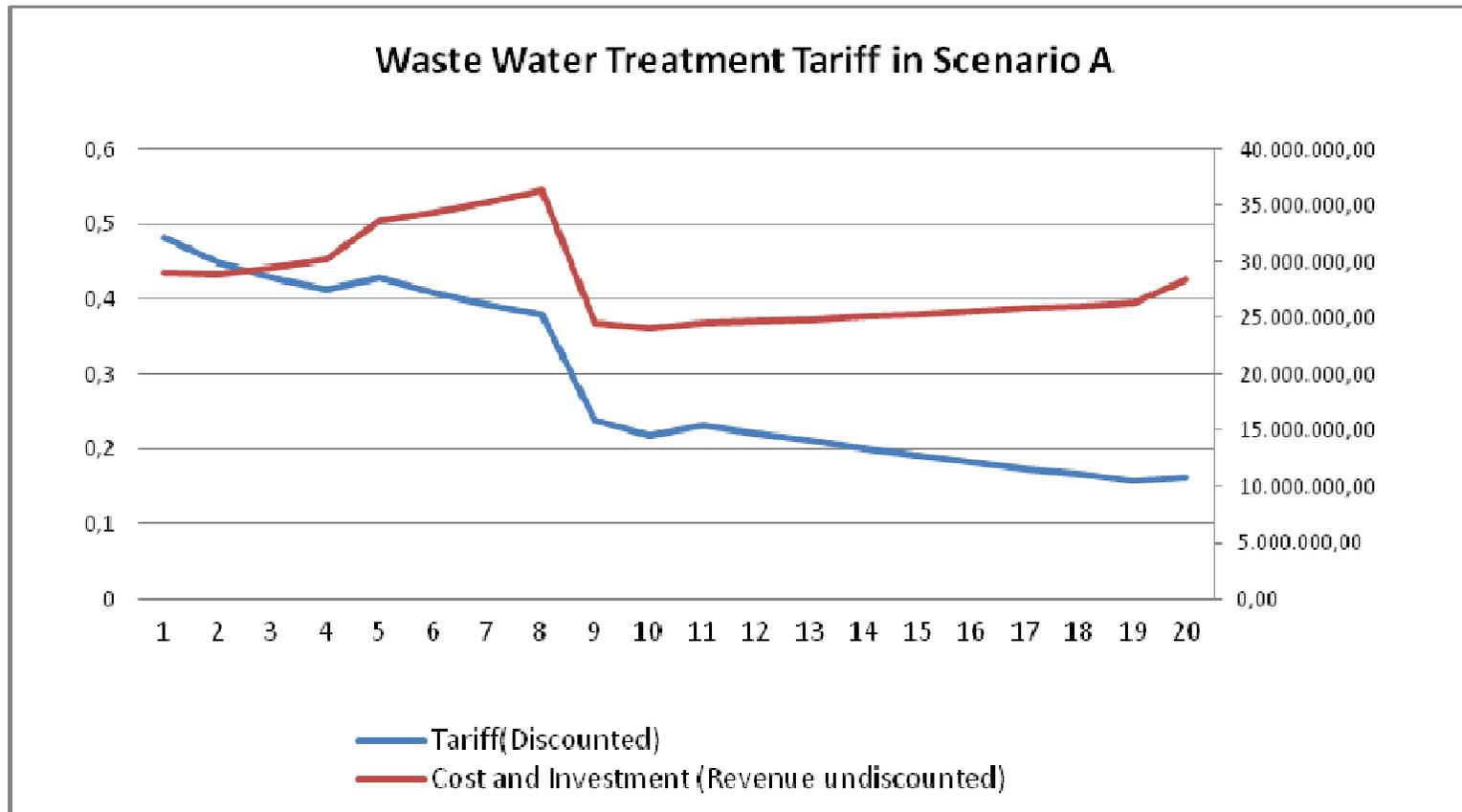
- An investment of 81 million euros, distributed in the first 8 years.
- The project will be implemented for 20 years.
- A state grant will be approved to cover 10% of the total cost.
- IRES tax rate of Milan is 27.5%.
- 95% of the cost of employees are fixed costs, with the rest being variable costs.
- The plant is financed with 50% of the equity and 50% of debt, with the real cost of equity of 6% and real cost of debt 4.5%.
- The inflation rate on revenues and operating cost is expected to be from 1.5% to 2% annually and efficiency rate is expected to increasing by 0.5% every year.
- The expected nominal change in cost of employees is set to be 2%.
- A soft loan is available to cover 50% of the physical capital with a 4% annual interest.

Scenario A



The tariff from waste water treatment in Milan is 0.23 euro/m³. The plant will gain negative profit from providing waste water treatment services through the whole operating periods. Also the total net present value would be -102 million for the investment, which is not acceptable for the investor.

Scenario A



It is instructive to discover that the tariff needed is much higher than the original one. However, as the revenue has to cover the cost in every financial year, the tariff demonstrates a decreasing pattern, starting from 0.44 in the beginning.

Scenario A

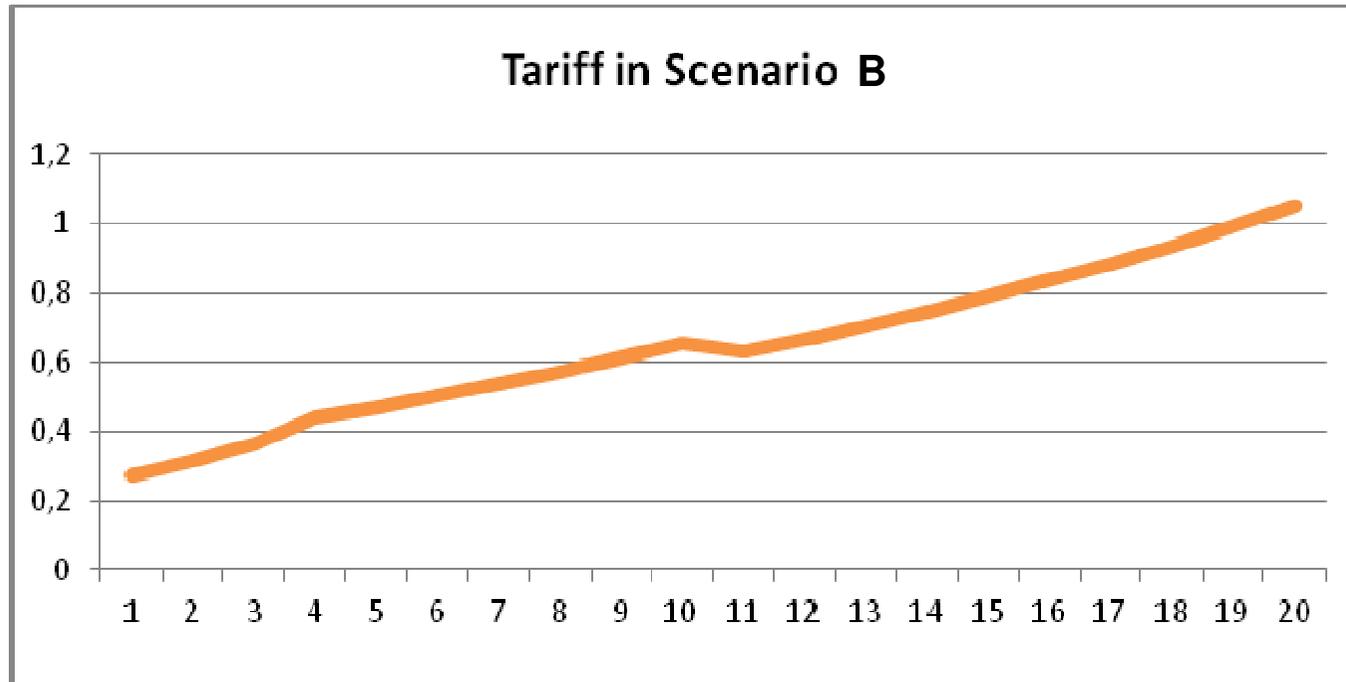
Financial Status in Scenario A (Mil. Euro)		
OPERATING PROFIT	GROSS PROFIT	NET DISCOUNTED CASH FLOW
9.93	9.93	
10.75	11.30	-0.68
9.75	10.83	0.18
9.75	11.38	0.45
9.74	11.96	0.87
9.72	12.57	-0.49
9.71	13.22	0.22
9.70	13.93	0.68
9.69	14.69	1.08
-0.21	4.78	3.74
-0.23	4.77	2.47
-0.23	4.76	2.55
-0.23	4.76	2.43
-0.23	4.76	2.30
-0.24	4.76	2.18
-0.24	4.76	2.06
-0.24	4.75	1.95
-0.24	4.75	1.84
-0.25	4.75	1.74
-0.25	4.75	1.65
-0.60	4.39	1.48

Scenario A

With the tariff updated, the plant will be able to make positive operating profit during the first 8 period, with the support of investment.

Also we get positive net present value of 30 million with the updated tariff.

Scenario B



To address the problem that residents may not accept high tariff at the very beginning, we give up the rule that the finance of the plant should be balanced every year.

This tariff pattern is an undiscounted value increasing for the following 20 years. It starts from 0.27 euro/m³, which is normal price for common residents of Milan.

Conclusion

- We decided that the best solution for the case we presented is **the B scenario**, because:
 - It allows to cover all the cost and the operating costs of the investments;
 - It's more realistic in decreasing the chart of the tariff, that means the tariff starts at the actual value of 0,27 Euro/m³ and it could be acceptable for the population.
- The scenario A includes some problems:
 - With the current tariff it's not possible to cover the costs of the project from the investments, meaning that the local regulator set the tariff that is not in line with the legal framework at national level (Legge Galli). The problem is that Gross Profit seems to be too high, thus the local regulator may intervene in order to reduce the extra profits that the company is making.
This will affect also the Net Present Value diminishing it.