

WORKING PAPER

The water sector in Italy



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The Water Sector in Italy

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1. THE LEGAL FRAMEWORK FOR INTEGRATED WATER SERVICES IN ITALY

In January 1994 a reform of water services was approved in Italy introducing extensive innovations which would heavily impact the structure of the sector, both on the demand and on the supply side. The main ones were:

- Clear statement of the principle of public property of water resources;
- Definition of integrated water services: for the first time a definition of the chain of interrelated activities was offered encompassing production (bulk supply), transportation and distribution of water for private use, and also sewage and treatment of wastewater;
- Devolution of many functions for service organization to Regions: almost a federalist approach “ante litteram”;
- Organization of water services on the basis of optimal territorial areas (ATO), meant to respect natural water basins while avoiding at the same time the existent fragmentation in order to achieve adequate operational scale;
- Careful exam of existing infrastructure assigned to the ATOs;
- Service development planning on the basis of an estimate of works to be carried out and of the patrimonial, financial and budget implications of such projects;
- Adoption in planning of water tariffs including all foreseen expenditures, the underlying principles being the total coverage of costs and rate increases subject to limitations typical of Price Cap systems;
- Service assignment based on an operating agreement developed according to standard contracts set up at the regional level (referring to a framework law for local public services);
- Oversight of the sector by a supervising body (Committee for the supervision of water resources use) established at the Environment Ministry;
- Provision of relevant information feedback systems through an Observatory for water services.

One of the basic principles of the reform was vertical subsidiarity: an important role was in fact assigned to local bodies (municipalities and provinces) in establishing ATOs, key actors in the implementation process; and to Regions, in charge of shaping and organizing the set of necessary activities. It has been a matter of lengthy discussion to determine whether this feature has been a relevant advantage or a brake and a cause of friction in the reform process. With time a negative evaluation has become predominant.

The 90s had seen at the EU level the beginning of a debate that, at the birth of the third millennium, would produce the EU Framework Directive 2000/60/CE,

considered by the European Commission as the foundation of a “modern, holistic and ambitious policy for water”. If the Italian reform had been implemented as scheduled, or even with reasonable delay, the country’s water sector could have met the European date with an ample array of subjects and tools to answer the European requirements; unfortunately it did not happen.

The recent report on “First phase of implementation of the Framework Directive 2000/60/CE” describes a picture “more critical than expected”, since many member States report an elevate percentage of water masses failing to achieve the Directive’s objectives; as far as Italy is concerned, the Commission states that no information has been made available.

About the reception of the Directive in nation legislations the Commission notes several cases of delay for which it has started eleven infringement procedures resulting in five convictions (Italy being one of the five, case C-85/05), and the inadequate quality of the transferring norms in nineteen States (again including Italy). The implementation of administrative provisions, i.e. the definition of water districts and of the governing authorities, is on the whole satisfactory, although Italy is in the lower part of the ranking of the EU-27. Italy is also at the very bottom of the scale for compliance with obligations of information. In both rankings the distance of our country from the Community average is thus substantial.

The evaluation of the first phase of implementation of the Framework Directive includes a specific exam of the enforcement of article 5, which requires member States, for each water district and within four years, to carry out an analysis of: (a) the district’s characteristics, (b) the impact of human activities on surface and underground waters, (c) the economics of water utilization.

This work is considered at the Community level of fundamental importance for the implementation of the Directive since, besides examining the water resources and the pressures bearing upon them, it requires a careful economic evaluation of both water utilization and water services in order to reach satisfactory estimates of *Full Cost Recovery*. The Commission finds that a significant, although unequal activity has been carried out by the member States; only two infringement procedures are still open, concerning Greece and Italy.

If adoption of new Community regulations has been somewhat difficult, innovations in the national legal framework have not been lacking.

In April 2006 a new, detailed and profuse system of environmental regulations was approved: 318 articles and several attachments, for a total of 370 pages.

Although we cannot completely describe here the part concerning integrated water services, we can sum up the most significant innovations still in force¹:

- The notion of district plan is defined for the first time in a legal regulation and includes the following activities:
 - An assessment of infrastructure, in order to identify their condition and functioning;
 - A program of interventions to be carried out, both for extraordinary maintenance and for new works, in order to achieve at least the minimum level of service and to meet the foreseen demand;
 - A description of the management and organizational model “defining the operational structure to be adopted for ensuring service to consumers and implementation of the interventions program”;
 - An economic and financial plan, including statement of assets and liabilities, profit and loss statement, financial report; to this a yearly forecast of proceeds from tariffs must be added, covering the whole period of the assignment contract and ensuring the achievement of economic and financial balance and respect of effectiveness and efficiency principles in management.
- The tariff regulation confirms criteria already spelled out in the previous reform, but integrates them often underlining the role of environmental costs, stating the “polluter pays principle”, demanding the adoption of the so called “cost recovery” and in fact formally introducing in our legal framework the already mentioned *Full Cost Recovery*.

Another reform contribution has just been started with a new proposal by Government of a framework law on environment; we will not delve into it, however, because it is still far from a final definition. It may be of more interest to give here more details on regulations concerning tariffs and the assignment of service.

Tariff computation is carried out on the basis of the so called Method; the computation rule is the following (with all variables at constant value):

$$T_n = \left(\frac{C + A + R}{VE} \right)_n \quad [1]$$

where

T_n is the real average tariff forecast in the area plan for the year n;

¹ One of the main innovations, the creation of a sector Authority to supervise integrated water services and waste, has been later repealed by the legislator, reinstating the former Committee for the supervision of water resources use.

- C is the total amount of operational costs forecast in the area plan for year n (set on the basis of estimates compared with results of parametric cost functions), minus a curtailment for efficiency improvement (X);
- A is the part of depreciation cost forecast in the area plan for year n , calculated applying the fiscal rates – according to accounting principles and at the maximum level allowed by fiscal laws – to the assets initially assigned to the managing company or added later;
- R is the return on invested capital in the year n , calculated applying a 7% rate the value of invested capital as stated in the company’s books at the date of the enactment of the Method and of the area plan;
- VE is the volume supplied in the year n according to the plan forecast.

The resulting tariff value must satisfy the following growth constraint:

$$\frac{T_n}{T_{n-1}} \leq (1 + K) \quad [2]$$

where K is the price limit for year n , defined on the basis of the tariff thresholds fixed by the Method.

Tariff values are then translated from constant to current according to the programmed inflation ratio (Π).

This procedure, from the point of view of risk allocation, is somewhat similar to the *Price Cap* criterion since the determination of the maximum tariff level, external to the actual management behaviour, is based on forecast evaluations and does not consider the possibility of guaranteed ex-post reimbursements.

The Method establishes that the agreement between ATO and entrusted company must regulate, among other aspects, “a three-yearly revision on efficiency improvements, correspondence between average and calculated tariff, achievement of objectives of service level and investment implementation”.

We can also observe that, by writing [2] through [1], we get

$$\frac{(C + A + R)_n}{(C + A + R)_{n-1}} \leq (1 + K)(1 + ve) \quad [3]$$

where ve indicates the percentage variation in the forecast of the volumes supplied in the two periods considered.

The meaning of [3] is as follows: once the price limit has been determined according to the Method, the actual constraint on the growth of the total amount of cost components included in the tariff may be relaxed in the plan through a forecast of growth in the volumes supplied.

Also relevant is the possibility of adjustments that can be made “at any time” when “significant gaps from plan forecasts” occur concerning, among others, “the correspondence between income resulting from the application of the tariff structure and income expected from the average tariff determined in the assignment agreement, in order to bring about the appropriate variations”.

The Method we have briefly described was due for a revision on capital remuneration within two years from enactment, and within five years as a whole. It was created in 1996, but it has not been revised since. This is the cause of many difficulties concerning the adequacy of the computation procedure to the sector’ fundamentals, and also of some risks about the legitimacy of compensations. Some Italian Regions, to remedy for the inactivity of the State, have enacted regional tariff regulations, with the advantage of finding up to date solutions for some critical issues and the disadvantage of generating some new ones.

Coming to regulations concerning ways of assigning the service, the first comment to be made is that they have been subjected to a sort of cyclical dynamics, which might settle only thanks to the gradual shaping of an EU legal framework. The 1994 reform was connected to the legislation on local government existing at that time (Law 142/90), introducing however for the first time some criteria of function separation: managing on one side, planning, control and regulation on the other. This made in fact impossible direct management of service by local government, but was not sufficient to set clear development outlines for the sector. After several attempts at reform and an infraction procedure started by the European Commission, a new legal arrangement was reached in 2003 (by means of an amendment to article 113 of the “Testo Unico EE.LL”), providing for three modes of entrusting water services: choice of a private company through public tender; choice of a private partner in a public limited company, also through public tender; direct assignment of service to a public ownership company with the requirements established by EU rules for in-house delegation. This seemed a good basis to finally allow the organization of water services in new ways, but three factors concurred in further petrifying the entrusting system: the discussion developing at that time on “environmental code”, the national courts giving contradictory opinions on mixed capital companies, and the position of the European Justice Court against entrusting of service through tender to public limited companies only. The only assignments taking place since then have been in-house, since the local authorities have seen less “regulation risks” in this type of delegation. Recently – August 2008 – a new law was passed by the Italian Parliament on ways of entrusting economically relevant local public services; this law provides for entrustment through public tender as the standard procedure, allowing for

dispensations in specific cases if consistent with the principles of the European Treaty, and leaves the definition of aspects fundamental for the sector's regulation to subsequent decrees. The new law tends to harmonize regulations concerning different sectors and explicitly mentions delegation of integrated water services to order the closure within 2010 of contracts not assigned through public tender. Only seven months passed before a specific norm had been approved (in the decrees complementary to the Budget Law for 2008) to suspend all entrusting proceedings at the starting stage and provide for the evaluation of existing difficulties. Also in the last couple of years regulations on managers of companies participated by public entities have taken the direction to limit their compensation to what is allowed for public administrators.

The situation we have described has kept away from Italy operators active on international markets and has frequently been an obstacle for the growth of national companies, besides causing other obvious difficulties in: recruiting and developing competent human resources, finding financial resources and accessing credit, planning the sector in a mid-long range perspective - an exercise often reduced to a mere scenario analysis shaped by the legal framework evolution more than by the needs of the local communities to be served or by the outlook of reference markets.

2. THE ORGANIZATION OF INTEGRATED SERVICES

2.1 The organization of Optimal Territorial Areas

The Optimal Territorial Areas (ATO) provided for by regional regulations for reorganizing integrated water services are at present 92²; they are all established and operational, except one.

In the following table one the main dimensional features and association arrangements of existing ATOs are described.

² The autonomous provinces of Trento and Bolzano, on the basis of their special charter, have not enacted the provisions of the Galli Law and have not established ATOs. Some Regions recently changed the borders of some areas, so that their final number will be 91 in the future.

Tab. 1 – Association arrangements chosen and main dimensional features

Region	Association provided for by regional regulation	ATO established	Association arrangement of ATO established		Population (Istat 2001)		Municipalities (n.)		Area (Km ²)	
			Cons.	Conv.	Max.	Min.	Max.	Min.	Max.	Min.
Piemonte	Conv.	6	0	6	2.153.258	253.906	306	147	6.903	2.015
Valle d'Aosta	Cons.	1	1	0	119.548	119.548	74	74	3.624	3.624
Lombardia	Cons./Conv.	12	4	8	2.450.999	176.856	244	1	4.784	182
Trentino Alto Adige	No Ato									
Veneto	Cons./Conv.	8	5	3	1.081.451	54.505	144	10	3.596	162
Friuli Venezia Giulia	Cons./Conv.	4	2	2	516.933	136.491	136	6	4.864	212
Liguria	Cons./Conv.	4	0	4	878.082	205.238	69	32	1.838	882
Emilia Romagna	Cons./Conv.	9	4	5	94	263.872	60	18	3.449	534
Toscana	Cons.	6	6	0	1.191.246	300.082	60	34	7.586	2.414
Umbria	Cons.	3	3	0	457.006	151.239	38	22	4.302	1.953
Marche	Cons.	5	5	0	387.215	114.036	67	27	2.892	652
Lazio	Cons./Conv.	5	0	5	3.599.234	170.379	112	38	5.109	2.498
Abruzzo	Cons.	6	6	0	436.045	75.249	92	35	2.298	1.502
Molise	Cons./Conv.	1	0	1	320.601	320.601	136	136	4.438	4.438
Campania	Cons.	4	4	0	2.747.938	712.468	195	78	4.775	906
Puglia	Cons.	1	1	0	4.019.566	4.019.566	258	258	19.363	19.363
Basilicata	Conv.	1	1	0	597.768	597.768	131	131	9.992	9.992
Calabria	Cons./Conv.	5	0	5	733.797	170.746	155	27	6.550	1.139
Sicilia	Cons./Conv.	9	5	4	1.235.923	177.200	108	12	4.992	1.614
Sardegna	Cons.	1	1	0	1.631.880	1.631.880	377	377	24.090	24.090
Italy		91	48	43	4.019.566	54.505	377	1	24.090	162

Source: Coviri, 2008

As one can see from the table, population and territory of the ATOs can be very different: in 5 cases they are the same as the Region's, in other cases their dimensions are smaller than the Province, in some other cases they identify with a specific urban aggregate. The average ATO's population is slightly more than 600.000.

The association arrangements chosen are almost equally divided between the two standard types: 48 ATOs have opted for the Consortium between local authorities and 43 have chosen the Convention. Generally the Convention is the preferred type in the North of the country and the Convention (with the exception of the Lazio Region) in the central and southern part.

2.2 Types of service assignment

The recent Report on the state of water services produced by the Committee for the supervision of water resources use (Coviri) gives some data on types of service entrusting adopted at present. The situation in 207 shows that 67 entrusting agreements have been carried out concerning a population of about 44 millions. In these 67 areas 106 operators are active, because in some cases the service was assigned to several operators. A large majority (64) of entrusted operators are public owned companies (*in house*); slighter numbers (31) occur for mixed ownership (public-private) companies, and there are only 5 cases of delegation to public limited companies (Coviri, 2008)³.

Tab. 2 – Entrusting agreements by geographical area

	Ato	Ato with entrusting agreements	Entrusted operators	Private companies	Mixed ownership companies with selected partner	Mixed ownership companies with financial partner	Public owned companies	Other
North	45	31	68	0	4	15	44	5
Centre	19	17	19	1	9	1	8	0
South	18	13	13	0	1	0	11	1
Islands	10	6	6	4	1	0	1	0
Total	92	67	106	5	15	16	64	6

Source: Coviri, 2008

An analysis by geographical area shows that the ATOs that have not yet assigned the service are mainly in the North; in the same area direct entrustment to public owned companies is predominant.

³ 6 operators cannot be classified in the 3 types recognized by the D.lgs 267/2000.

3. THE STRUCTURE OF INTEGRATED WATER SERVICES

3.1 Infrastructure and equipment

The 2007 Blue Book (Anea-Utilitatis, 2007) describes the results of a research on the state of water service based on the area plans existing at June 30, 2007. The plans approved by that date were 96 for 77 ATOs.⁴

Tab. 3 shows some data taken from the surveys carried out by the ATOs when drawing up their area plans. The number shown concern the extent of drinking water and waste water networks and the capability of water treatment plants in terms of equivalent population numbers (AE). In Tab. 4 absolute values are weighted to reflect the resident population in order to show the degree of coverage for each service.

Tab. 3 – Infrastructure facilities by service and geographical area

Geographical area	Drinking water network (Km)	Wastewater network (Km)	Potential of wastewater treatment plants (AE)
North – West	68.113	36.355	12.294.061
North – West	60.263	28.581	9.307.072
Centre	72.435	32.144	7.848.734
South	88.002	41.475	11.190.048
Islands	34.156	19.606	5.858.154
Italy	322.969	158.161	46.498.069

Source: Anea-Utilitatis, 2007

The drinking water network covers more than 90% of the population, with no great differences among the geographical areas; on the other side, collection and treatment of wastewater is clearly unsatisfactory. The wastewater treatment system is, on the average, particularly backward: well beyond the coverage (69%) reported. This index probably overestimates the real potential of the system, since plants with registered excess capacity in urban areas cannot obviously meet unfulfilled demand from other areas⁵. In this type of service there is plenty of room for significant efficiency improvements, also considering the requirements resulting from EU Directive 2000/60 on improvement and conservation of a good environmental quality in water basins.

⁴ The significance of the sample surveyed is quite good since plans concerning 6700 municipalities and a population of over 50 millions have been examined.

⁵ The low level of coverage is also influenced by the fact that about 5% of the plants are not functioning (Massarutto, 2008).

Tab. 4 – Coverage of services by geographical area

Geographical area	Drinking water %	Wastewater %	Wastewater treatment %	Per capita drinking water network Km/inhab.	Per capita wastewater network Km/inhab.	Per capita potential wastewater treatment plants AE/inhab.
North – West	96,8	89,8	77,6	6,5	3,5	1,3
North – West	93,8	81,7	61,7	8,6	4,5	1,7
Centre	94,0	83,4	70,8	9,4	3,8	1,2
South	96,3	84,7	69,8	9,5	4,4	1,1
Islands	97,3	77,8	57,4	6,2	3,5	1,0
Italy	95,8	84,2	69,1	8,4	4,0	1,2

Source: Anea-Utilitatis, 2007

3.2 Demand and supply of drinking water

With about 740 cm/per year per inhabitant (more than 2000l/per day), Italy is at the top of European ranking of water consumption per inhabitant (average of EU15: 612/cm per year). The overall yearly demand for water resources in Italy is estimated to be about 50 billions cubic meters.

Typical of Italy is the sizeable exploitation of groundwater: 23% of total water resources comes from this source, compared with a European average of 13%. About half of this ground water is taken up by private consumption⁶.

Demand of water resources for different utilization is as shown in Tab. 5⁷:

Tab. 5 – Water resources demand by type of use

Uses	%
Domestic consumption	14,21
Agriculture	48,97
Manufacturing	24,86
Energy	11,96
Total	100,00

Source: Autorità di vigilanza sulle risorse idriche e sui rifiuti, 2006

⁶ Autorità di vigilanza sulle risorse idriche e sui rifiuti (2006), p. 40.

⁷ Autorità di vigilanza sulle risorse idriche e sui rifiuti (2006).

Tab. 6 shows the main numbers for private consumption demand.

Tab. 6 – Quantities of drinking water by geographical area (thousands of m³)

Geographical Area	Water collected (1)	Water purified (2)	Water piped in distribution networks (3)	Water delivered (4)	(2)/(1) %	(4)/(3) %
North - West	2.402.685	1.068.033	2.284.149	1.750.436	44,5	76,6
North - East	1.601.856	538.167	1.426.365	1.045.475	33,6	73,3
Centre	1.651.073	307.562	1.533.702	1.055.490	18,6	68,8
South	2.247.419	488.127	1.761.727	1.081.560	21,7	61,4
Islands	802.803	307.428	793.421	517.593	38,3	65,2
Italy	8.705.836	2.709.317	7.799.364	5.450.554	31,1	69,9

Source: Istat, 2006

The total amount of water collected for drinking use is over 8,5 billions of cubic meters, i.e. about 300 litres per person every day. Obviously larger quantities of collection are found in the Regions with higher numbers of inhabitants.

The percentage of water treated varies as a function of the hydrogeological characteristics of the territory; where more ground water is available (as in Abruzzo, Lazio, Campania) the quality of the natural resource is better and, as a rule, there is no need of important operations to purify raw water. Where surface waters are used some treatment is unavoidable and the quantities to be treated can be much higher⁸. As an average, 31% of the water collected is purified.

The difference between water piped in the distribution network and water delivered does not measure exclusively leaks in the pipes. Actually this index depicts the quantity of water which has “not been invoiced”; the causes may be leaks in the network (the main one), but also service requirements (such as network cleaning), excess water flooding, theft or unauthorized drawing, no invoicing for public use, etc. From Tab. 6 one can see that about 30% of the water input in the distribution network is not invoiced⁹. The biggest losses occur in the South, where the index for some Regions (Puglia, Sardegna, Abruzzo) is close to 50%.

⁸ In the Basilicata Region 83% of the collected water has to be treated.

⁹ Muraro (2008) reports a higher estimate of losses (40%).

3.3 Wastewater treatment

According to the ISTAT survey, plants for wastewater treatment in Italy are over 15.000. Only 11% of them have the technology necessary for tertiary treatment of wastewater; their size is, however large and so they are capable of serving a large number of users; the supply of tertiary treatment is thus guaranteed for 44% of the demand expressed in terms of equivalent inhabitants. Plants carrying out only primary treatment are 54% of the total but, because of their small size, cover only part of the demand; also, because of their limited technology, they do not meet the requirements of environmental laws¹⁰.

Tab. 7 – Functioning plants for urban wastewater treatment

%

Type of treatment	N. of plants
Primary	53,9
Secondary	35,3
Tertiary	10,8
Total	100,0

Source: Istat, 2006

Plants in activity receive water to be treated from a sewage network which in 70% of cases is “mixed”, receiving at the same time wastewater and rainwater. This is a cause of important technical problems in conditions of rough weather, both for the greater input of water and for its anomalous composition (soil and heavy metals).

The large number of plants should not lead to the conclusion that the Italian treatment system can meet all the needs on the demand side, always and anywhere. As already mentioned the degree of coverage by the service is close to 70%; in practice a complete treatment of wastewater is ensured for about 55% of the population. Unfortunately for 42% of the population the available wastewater treatment is not sufficient because not all sewage waters are treated, and the remaining 3% lives in municipalities where waters conveyed to the sewage network are not treated at all.

¹⁰ Istat (2006).

4. MANAGEMENT OF INTEGRATED WATER SYSTEMS

4.1 Operational costs

In this section we examine operational costs reported in the Anea-Utilitatis 2008 research on area plans. They are the programmed values computed to determine tariffs in the area; therefore they do not perfectly match with the costs we shall discuss in section 6, which are costs actually met (and reported in yearly balance sheet) by a sample of companies. The two types of data, however, complement each other and give a reliable picture of the operational models of companies operating in the water sector of our country.

Operational costs reported in area plans are generally around 0.85 euro per cubic meter of distributed water. They are usually higher in the Centre, South, and Islands geographical areas.

One third of operational costs comes from labour expenditures; another significant part (about 1/6) from concession fees paid to local authorities for former loans and for the use of assets¹¹.

The average values reported do not correctly represent reality because these two components of cost have a significantly different weight in different geographical areas. Generally, but with important exceptions, labour costs are more important in the Centre-South Regions and concession fees in the Centre-North Regions.

Operational costs, plus depreciation charges and capital remuneration are the basis for tariff determination. In time the weight of labour costs on the tariff is bound to drop while the other two types of cost increase.

Tab. 8 – Operational costs by area geographical area (€/m³)

Geographical area	2008	2010
North - West	0,75	0,68
North - East	0,82	0,78
Centre	0,89	0,88
South	0,90	0,87
Islands	0,99	0,96
Italy	0,87	0,84

Source: Anea-Utilitatis, 2008

¹¹ On this subject it must be noted that the D.lgs 152/06 has finally established that the use of water infrastructure belonging to local authorities must be granted free of charge.

Tab. 9 – Weight of labour costs on operational costs (%)

Geographical area	2008	2010
North - West	27,5	25,9
North - East	23,2	22,9
Centre	36,4	36,8
South	31,9	31,8
Islands	42,4	42,5
Italy	31,9	31,6

Source: Anea-Utilitatis, 2008

Tab. 10 – Weight of concession fees on operational costs (%)

Geographical area	2008	2010
North - West	20,0	22,1
North - East	20,7	20,5
Centre	19,1	19,3
South	10,0	10,3
Islands	4,0	4,2
Italy	14,9	15,5

Source: Anea-Utilitatis, 2008

4.2 Prices

According to the existing regulation the tariff of integrated water service is made up of three parts: drinking water, wastewater and treatment. The structure of the drinking water tariff is more complex than the others, which generally have a linear structure¹². For drinking water the law provides for a fixed fee, and a variable fee proportional to consumption. The variable fee is applied according to consumption brackets with tariffs increasing as a function of quantity of consumption and type of use¹³. Specifically, a reduced tariff is applied to the first bracket for private use (so called essential consumption) and the loss of proceeds due to this reduction is offset by the higher proceeds from tariffs applied to upper brackets. The ratio between the reduced tariff and the maximum consumption tariff is on an average 1/6¹⁴.

¹² In some ATO a multipart tariff is adopted also for wastewater and treatment.

¹³ Besides domestic residents use (the most important), the other types are: private non resident; agriculture; breeding, crafts, industry, retail, industry, public and “other”.

¹⁴ Coviri (2008).

Between 2004 and 2006 the three tariffs have generally increased significantly¹⁵ and further increases are forecast in the area plans for the future. The following table shows that the overall unit income (the three tariffs together) should increase by a further 3% in the next years¹⁶.

Tab. 11 – Tariff by geographical area

Geographical area	2008	2010
North - West	1,01	1,10
North - East	1,27	1,39
Centre	1,35	1,45
South	1,27	1,33
Islands	1,31	1,39
Italy	1,23	1,31

Source: Anea-Utilitatis, 2008

The increase is mainly due to the impact of investment programs which will generate higher costs for depreciation and for capital remuneration.

Tab. 12 – Weight of operational costs on tariffs

Costs	2008		2010	
	€/m³	%	€/m³	%
Operational costs	0,90	73,2	0,89	67,9
Depreciation	0,18	14,6	0,23	17,6
Capital remuneration	0,15	12,2	0,19	14,5
Tariff	1,23	100,0	1,31	100,0

Source: Anea-Utilitatis, 2008

4.3 Investments

4.3.1 Planned investments

Investment requirements resulting from an analysis of intervention plans drawn up by the different ATOs are shown in the following Tab. 13.

¹⁵ According to Coviri (2008) the drinking water tariff applied to the first bracket (from which comes more than half of the total proceeds) has seen a 6% increase, wastewater and treatment 11%.

¹⁶ In fact the general feeling is that increases will be larger. Tariff revisions reported in the Blue Book 2008 show tariff amendments for the next years almost always above 10% (Anea-Utilitatis, 2008).

Tab. 13 – Investment requirements (€)

Geographical area	Total from plans (30 years) €	Yearly total €	Public financing	
			€	%
North - West	15.282.313	509.410	788.718	5,2
North - East	15.600.801	520.027	1.404.672	9,0
Centre	9.498.305	316.610	486.363	5,1
South	18.066.368	602.212	2.154.295	11,9
Islands	8.088.992	269.633	1.729.058	21,4
Italy	66.536.779	2.217.893	6.563.106	10,8

Source: Anea-Utilitatis, 2008

The numbers shown are computed extrapolating data in plans (which have different time spans) to a common period of 30 years. The financial requirement foreseen for the next three decades amounts to more than 65 billions euro and will be focused mainly on the South of Italy where the major wants for infrastructure and service coverage are found. The public financing will also focus on the same Regions (but also on the Islands).

The following Tab. 14 shows the data taken directly from plans examined in the research Anea-Utilitatis (2008). The amounts actually forecast in plans are necessarily lower than those shown in Tab. 13. The exam of actual data allows, however, to distinguish among planned investments according to their characteristics. In Tab. 14 planned investments are reported by type and purpose (maintenance or new infrastructure).

The first classification highlights the stronger commitment in favour of the South and also the higher financial commitment in collection and treatment of wastewater. The second classification shows, on the other side, the prevalence of investment for maintenance, representing a fundamental need of our integrated water service: interventions for functional recovery of existing infrastructure. In the last decades the financial commitment for network maintenance has not been particularly high because the policy of debt reduction has reduced financing to local authorities and to their public utilities. Also environmental problems have come to the forefront only recently. These are the factors explaining the main critical conditions of our water system (insufficient treatment and disrepair of the infrastructure) and the planning choices made by ATOs concerning investment.

Tab. 14 – Investments in integrated water services

Geographical area	Drinking water			Wastewater and treatment			Public financing (€)	Total (*) (€)
	(€)	New infrastr.re %	Maintenance %	(€)	New infrastr.re %	Maintenance %		
North – West	2.974.698	47,4	52,6	4.849.399	41,5	58,5	463.446	8.973.540
North – East	1.297.465	23,4	76,6	1.906.063	78,0	22,0	426.229	4.733.855
Centre	2.633.796	50,3	49,7	3.173.067	47,0	53,0	352.578	6.885.585
South	6.723.748	52,5	47,5	6.658.628	51,3	48,7	1.689.370	14.167.406
Islands	2.706.935	18,8	81,2	2.962.243	36,5	63,5	1.670.556	7.815.306
Italy	16.338.804	43,3	56,7	19.553.382	45,5	54,5	4.602.234	42.583.008

Source: Anea-Utilitatis, 2008

(*) Totals do not match the sum of partial data because plans include also investments for different purposes

Since plans concern different time spans and ATOs have different demographic sizes, it is necessary – in order to compare the financial commitment of different ATOs – to have per capita yearly data, the only ones useful for comparison purposes. The amount of investment has thus been amended according to the number of years considered and to the resident population. The result is shown in Tab. 15, where one can see that a higher commitment is required from residents in the South and the Islands. The per capita expenditure data also confirm the priority given to interventions for collection and treatment of wastewater.

Tab. 15 – Yearly per capita investment for integrated water service (€)

Geographical area	Drinking water	Wastewater and treatment	Integrated water system (*)
North - West	11,50	22,67	34,08
North - East	18,83	26,97	48,90
Centre	12,48	14,41	29,03
South	21,00	21,91	43,28
Islands	19,22	21,03	40,85
Italy	16,21	20,58	38,07

Source: Anea-Utilitatis, 2008

()Totals do not match non the sum of partial data because plans include also investments for different purposes*

The estimate of per capita investment requirements in the Anea-Utilitatis 2008 research (38 euro per inhabitant) is consistent with the data from the analysis of the Italian situation carried out by Coviri (2008), but definitely lower than the correspondent estimates found in surveys about other nations.

Tab. 16 shows the results of some studies carried out in the US and in the UK; it can be easily seen that the Italian quantities (33 euro according to Coviri) are less than half of what is planned in those countries¹⁷.

Tab. 16 – Estimate of minimum investment expenditures per inhabitant in water services of some other countries
(euro; Purchasing Power Parities weighted values)

Countries	Yearly Investment per inhabitant	
	Minimum	Maximum
USA (2001-2019)	72	114
England and Wales (2005-2010)	80	
Italy (2007-2025)	33	

Source: Coviri, 2008

¹⁷ The data in the table have been made comparable applying equal purchasing power methodology. For details on the methodology used see the bibliography in Coviri (2008).

These conclusions are confirmed also by a comparison of investment requirements as a percentage of GNP.

Tab. 17 – Estimate of yearly investment requirements as a % of GNP

Countries	Minimum	Maximum
High income countries	0,35	1,20
Average income countries	0,54	2,60
Low income countries	0,70	6,30
Italy	0,15	

Source: Coviri, 2008

The requirement indicators we have reported must obviously be considered with some caution, but there is no doubt, however, that the gap between our data and the benchmark is significant. This would indicate that the financial commitment requested from consumers in our country is still not enough to meet the needs for modernization and development of the water system and that further massive investment programs (and therefore tariff increases) may be expected in the future in order to overcome the present critical situation.

4.3.2 Investments carried out

The Report on the situation of water services also gives some information on the degree of realisation of planned investments. The COVIRI survey states that at the end of 2006 only half (46%) of the investments planned for the preceding three years had been carried out (Coviri, 2008).

The realisation of planned infrastructure is the result of the combined action of many factors, such as the organizational efficiency of the company and its being able to meet the costs on its own. It must also be considered that the dynamics of investment may have a non-linear trend. The fact remains that the gap between planning and realisation is sizeable and that it underlines the unsatisfactory evaluation of the investment projects planned by operators.

4.3.3 The funding of investments

According to the “polluter pays principle”, national and European regulations have established that income from prices (and not the fiscal system) must meet all or most of the costs of supplying water services; this is also meant to

encourage resource use compatible with economic and environmental requirements.

With funding coming from tariffs, the cash flow for loans and mortgages taken out to finance investments are supported by consumers and resorting to public help is thus avoided.

Coviri (2008) gives some information on the structure of financing for investment. The Report tell us that the area plans originally provided for a 15% free grant from public authorities, and for tariffs generating enough for self financing, interests on debt and remuneration of employed capital; a few years after the approval of plans reality seems a bit different from the forecast, since public contribution has been around 21% and self financing has had limited importance.

Free grant public contribution has obviously been more important in the southern Regions¹⁸.

Tab. 18 – Types of investment funding (%)

Type of funding	Forecast	Realised
Debt	23	14
Capital increase (own capital)	1	11
Self financing	56	46
Local Authorities	1	1
EU financing	15	21
Other	4	7
Total	100	100

Source: Coviri, 2008

If we distinguish between the two main types of private capital funding (financing for the company or corporate finance and financing for the project or project finance), financing for big operators has been to the company, while cases of project financing are found for lesser industrial operators (Anea-Utilitatis, 2007).

4.4 Economic results of operations

The following table shows some summary data about the economic management of integrated water systems. These data have been offered from the Economic Division of Confservizi and include all companies associated to this trade

¹⁸ A survey by the Associazione Studi e Ricerche per il Mezzogiorno reports that public capital contribution amounts to: 28% in Northern Italy, 12% in Centre Italy, 41% in the South.

Association. Generally speaking, they do not represent the same group considered in the surveys which we have mainly used for this paper. With this warning the data can however be considered and integrated with other in order to have a more comprehensive view of the sector's functioning.

Tab. 19 – Balance sheet data (millions of current €)

Balance sheet entries	2002		2005		2007	
	€	Indexes	€	Indexes	€	Indexes
Revenues	3.717	100,0	4.883	100,0	6.350	100,0
Costs	4.282	115,2	5.540	113,5	6.750	106,3
<i>of which: Labour</i>	<i>1.006</i>	<i>27,1</i>	<i>1.125</i>	<i>23,0</i>	<i>1.200</i>	<i>18,9</i>
Economic results	204	5,5	257	5,3	290	4,6

Source: processing of Confservizi data

As one can see a significant performance improvement has been achieved in the sector in the past years. Revenues, however, are still not sufficient to cover costs, although the gap seems to be decreasing in time, as does the weight of labour costs.

5. THE DEGREE OF DEMAND SATISFACTION

5.1 Families' expenditures and their sustainability

Available average values of unit tariffs and of their specifications allow to calculate the average yearly expenditure of a hypothetical family with different volumes of water consumption. This exercise has been carried out by the Committee for the supervision of water resources use considering the tariffs of an adequate number of water basins. The results are presented in the following table.

Tab. 20 – Average yearly expenditure for drinking water consumption (€)

Expenditure	100 m ³	150 m ³	200 m ³	250 m ³
Average	109	170	250	344
Maximum	217	402	587	772
Minimum	44	63	81	100

Source: Coviri, 2008

The availability of average yearly expenditure has allowed Coviri to estimate its sustainability relative to income. Assuming a yearly supposed consumption of 200 cm¹⁹, expenditure has been computed as a ratio of average family income and of relative poverty level income. In literature on the sustainability of the tariff of water services the threshold values for the two cases are indicated between 3 and 5%; over this limit social hardships can occur and families may not be able to pay for the service (Coviri, 2008).

Results seem to prove that at present families expenditure for water services is on the average sustainable; it must be mentioned, however, that in some situations indexes have come close to threshold values (see the indexes for maximum expenditure).

Tab. 21 – Average yearly expenditure and sustainability for a yearly consumption of 200 m³

Expenditure	Yearly expenditure (€)	Expenditure per m ³ (€)	Sustainability	
			Average income	Relative poverty income
Average	250	1,25	1,07%	2,15%
Maximum	587	2,94	2,52%	5,04%
Miimum	81	0,40	0,35%	0,69%

Source: Coviri, 2008

If we look at international data we see that the indicators of family expenditures and of their sustainability are well below the average: about half of the corresponding indexes reported for important foreign cities.

5.2 Satisfaction for service

Regulations precisely define quality requirements of water for private consumption and the criteria to be adopted by Regions to classify surface waters that may be use for the production of drinkable water. Operators, as well as health authorities in charge, must carry out constant controls on water. Therefore existing conditions guarantee to citizens reasonable assurance on the quality of drinking water; However more than 70% of the population states to drink more than half a litre of mineral water a day (Istat 2007). Obviously Italian citizens have little trust in the quality of drinking water.

The yearly Report of the Committee for the supervision of water resources and waste to Parliament (2006) presents some data from the Istat survey on aspects

¹⁹ This is the average consumption for a family of three, using daily 180 litres per person.

of the daily life of Italian families carried out in 2005 (Istat, 2006). From this survey it appears that more than a third of Italians, for various reasons, does not trust the water supplied by operators and about a sixth complains of irregular water supply (disruptions, shifts in supply, rationing). Dissatisfaction indexes are higher for those living in the South and the Islands.

Tab. 22 – Satisfaction indexes for water services

Geographical area	% of families which do not trust drinkable water	% of families complaining of irregular water supply
North - West	33,3	7,8
North - East	26,4	6,6
Center	33,5	13,1
South	37,2	20,2
Islands	60,7	31,3
Italy	35,8	13,8

Source: Autorità di vigilanza sulle risorse idriche e sui rifiuti , 2006

6. CONSIDERATIONS ON OPERATIONAL FEATURES OF COMPANIES IN THE INTEGRATED WATER SERVICE. THE RESULTS OF A RESEARCH ON YEARLY BALANCE SHEETS

6.1 Introduction

An analysis of the operational features of companies managing integrated water services must necessarily be based on balance sheet data. Luckily the research on the balance sheets of a sample of companies operating in the sector that appears in the Blue Book Anea-Utilitatis 2008 makes it possible to express more significant comments than those that would have been allowed by considering only a limited number of cases²⁰. On the basis of data taken from this research we will outline in the next sections an overall view of the operational features of companies active in the Italian water sector, using a set of indicators to describe their economic and financial situation.

²⁰ The Anea-Utilitatis research concerns a sample of 37 companies serving a population of 22.5 millions. All of them are mono-utility companies of different size and localization. As far as size is concerned, 5 different classes of turnover have been created, ranging from Top companies with a yearly turnover of more than 50 millions euro to small companies with turnover under 10 millions.

6.2 Operating costs

Costs of standard operations first of all been examined from the point of view of their structure.

From Tab. 23 we can see the high incidence of costs for the purchase of services. They include the purchase of energy, but also of outsourcing of specific activities such as meter reading, invoicing, laboratory analysis, infrastructure design, etc. These costs have the same weight in almost all dimensional classes.

Tab. 23 – Cost structure. % distribution

Costs	Size				
	Top	Large	Mid - large	Mid - small	Small
Raw Materials	5,9	16,8	11,3	19,6	8,2
Services	44,9	33,4	44,0	41,9	48,0
Leased assets	6,2	9,4	9,8	9,6	1,9
Labour	22,7	23,7	23,9	18,7	24,1
Depreciation	13,7	11,4	8,8	8,0	14,0
Other	6,4	5,2	2,3	2,2	3,9
Total	100,0	100,0	100,0	100,0	100,0

Source: Anea-Utilitatis, 2008

Labour is another significant cost element; its relative importance does not appreciably change with size of the company.

Taken together labour and services purchased account for more than half of operating costs.

Since costs for services mostly concern outsourced activities previously carried out by company personnel, the labour intensive nature of the sector is confirmed.

The weight of costs for leased assets (concession fees, interest on loans, etc.) is higher for companies in the middle part of the size classification. Conversely, depreciation has greater weight in the first and last class. These two data balance each other and, taken together, underline a better capability for self financing of maximum and minimum size companies compared to companies in the middle which, for this reason, look more like “pure” service companies.

A further analysis concerns the incidence of costs on turnover. To this effect the Anea-Utilitatis research has selected the main operators in Italy and has compared their results with those of British companies in a comparable research

done by Ofwat. The comparison with British companies is naturally influenced by the different size of enterprises operating in the two countries, by the greater experience in regulation in the UK, and by different accounting rules; it may be read, however, as an indicator of the weakness of our operators as it underlines the excessive weight of operating costs in Italian companies and the lower incidence of depreciation (Tab. 24).

Tab. 24 – Balance sheet structure

Balance sheet entries	Italian companies		British companies	
	millions €	% of receipts	millions €	% of receipts
Receipts	1.804,6		10.769,5	
Operating costs	1.522,2	84,3	5.025,7	46,7
Depreciation	194,5	10,8	2.396,2	22,2

Source: Anea-Utilitatis, 2008

Many factors may explain the greater weight on turnover of operating costs but at present no studies exist to determine which are the most significant. Among them we can include a higher cost of financial capital, a regulation policy less effective in containing costs, lower tariffs applied in our country. Size (our major companies are in any case “small” if compared with British enterprises) does not seem to have an appreciable impact. Studies on the British water sector (for which reliable data are available) rule out, as a matter of fact, the existence of economies of scale for larger enterprises.

6.3 Labour cost and productivity

Other comments that can be made from the data in the Anea-Utilitatis research concern labour cost and productivity.

From the balance sheet of the companies studied we can find that the average cost per employee is just above 34.000 euro, well below the average cost for other enterprises in our country operating in the industrial and service sectors. To this effect we can consider, in Tab. 25, the average cost for employee reported by Mediobanca (2007).

Tab. 25 – Average cost per employee (Th.s €/empl)

Groupings in Mediobanca sample	Average cost
Public companies	56,4
Private companies	45,0
Mid size companies	42,0
Industrial companies	48,9
Tertiary sector companies	44,3
Mediobanca sample	47,5

Source: Anea-Utilitatis, 2008

A summary view of labour cost and productivity is given in Tab. 26. As one can see, indexes of labour productivity built with reference to sale and value added decrease almost monotonically with size; not so the index for average cost per employee, which shows a reversed trend for minimum size companies.

In general it must be remembered that labour cost is predominantly a fixed cost; size is therefore a strong element in accounting for the productivity level of this production factor. One can also note that the other significant cost entry in standard operations, expenditure for service outsourcing, has important fixed elements; this explains the greater weight of operating costs in smaller companies and their limited capability of generating positive net income. More on this in the following section.

Tab. 26 – Labour productivity indexes

Size	Th.s €/empl		
	Receipts	Value added	Average cost
Top	198,0	71,7	39,5
Large	194,8	72,9	32,3
Mid-large	160,3	56,0	32,8
Mid-small	177,2	47,0	27,4
Small	115,7	48,1	39,0
Sample	182,4	65,0	34,3

Source: Anea-Utilitatis, 2008

6.4 An overview of the economic and financial situation

Indexes shown in Tab. 27 highlight differences related to size:

- Companies in the Top class have the soundest asset and financial situation. Both the liquidity and the structure ratio are over 1. The debt equity ratio is limited and profitability indexes are satisfactory.
- Large companies show adequate profitability indexes but state a not negligible use of credit for investment financing (debt equity ratio=0,79).
- The group of mid-large companies shows some a peculiar imbalance between sources and use of financing. Specifically the liquidity and structure ratios show insufficient coverage of fixed assets with long term sources of financing, and excessive use of short term credit for investment financing. This is also confirmed by the debt equity ratio and the

- independence index, showing a limited use of risk capital to uphold investment programs.
- Smaller companies show a limited use of credit and financing of infrastructure mainly by means of one's own capital; but also limited or negative profitability indexes.

Tab. 27 – Balance Sheet Indicators

Size	Liquidity ratio	Structure ratio	Debt equity ratio	Independence index	ROI	ROE
Top	1,38	1,06	0,46	37,96	3,46	3,10
Large	1,04	0,87	0,79	30,53	3,12	2,07
Mid-large	0,83	0,62	1,19	22,67	2,17	3,12
Mid-small	1,04	0,86	0,46	34,26	0,45	0,47
Small	1,02	0,89	0,16	63,66	-2,09	-3,36
Sample	1,11	0,90	0,63	33,31	2,78	2,39

Source: Anea-Utilitatis, 2008

The information from this and other tables, although varied and multifaceted, describes an operational reality of Italian companies in the integrated water service sector which could be summed up, with some approximation and straining, in the following way:

- i) some very large companies exist which have by now achieved balanced economic and financial conditions, have adequate capital, show higher than average turnover per employee, are able to compensate labour in line other sectors, ensure an adequate return on invested capital; these companies, when compared with other internationally, show however some operational weak spots: excessive weight of costs and limited capability for self financing.
- ii) Other mid-large companies seem to be going through a process of industrial development driving financial debt; not all of them have adequate labour productivity and therefore they are not always able to ensure compensation for the production factors in line with other sectors.
- iii) Smaller companies are somewhat static and show little inclination for development: the low levels of debt and the prevalent use of one's own capital are an obvious limit to investment programs; the result is low labour productivity in terms of turnover per employee and accordingly a low capability to compensate production factors.

7. CONCLUSIONS

The long process of modernization which started with the Galli Law has now reached a point of no return. By now there is general agreement on the need to give up management by local government in order to improve economic results and efficiency. Problems still exist on the method to determine tariffs and on ways of entrusting the service; However even on these issues times seem right, by now, to get shared solutions in line with European regulations.

From another point of view there are doubts about keeping the existing number of ATOs: there are probably too many of them, and not always cut out on the basis of the hydrogeological characteristics of the territory. The idea is being advanced that optimal size should match that of the Regions. This would also help in pushing the Regions to play a more significant role in water policy. The role of municipalities and Provinces would accordingly be downsized (consisting mainly in an advising function), but system functionality would gain by it and maybe consumers could also have some small saving in the operating cost of institutions.

It is vital for public authorities to improve their capability for planning and regulating, since problems to be faced in collecting and treating wastewater are still huge. Besides, international comparisons on the amount of financial requirements show that needed resources are much larger than what is scheduled in area plans; for the time being operators (notwithstanding improving economic performance), are not able to meet the amount of expenditure that would in principle be required to achieve adequate service standards because full cost recovery through tariff is resisted. A stronger commitment from State and Regions is needed both in planning and regulation and in arranging for tools that may facilitate the involvement of private capital in management and in investment policy. The data from the companies' balance sheets seem to suggest that a bigger use of risk capital and long term debt (together with a policy of amalgamation of small enterprises) should be the guiding lines to get a more dynamic, efficient and competitive entrepreneurial environment. Regional guarantee funds could provide incentives for investment through a reduction of interest rates on loans; this could be the right step to move public contribution from capital spending to interest spending and to facilitate in this way the access of companies to financial markets.

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