

# Water Regulation: An Innovative Approach

Lorenzo Bardelli

**Abstract** An innovative approach was adopted by the Italian Parliament in 2011, together with the Government of Premier Monti, when it was decided that they would extend the competences—powers and functions—of the existing independent regulator for electricity and gas, Autorità per l'energia elettrica e il gas (AEEG), to the water sector (subsequently renamed AEEGSI, to include the reference to “sistema idrico” in the acronym). A further innovative approach was developed by AEEGSI in the definition of Italian water regulation. The present paper is a first illustration of both approaches, since my personal belief is that the degree of innovation of the second (in regulation) is deeply related to the degree of innovation of the first (in legislation). In Section “[The Reasons for the Innovative Approach in Legislation](#)”, some of the main reasons underlying the reform that was approved at the end of 2011 will be presented; in Section “[The New Regulatory Framework](#)”, a brief description of the functioning of the new regulatory governance is reported; in Sections “[First Regulatory Period \(2012–2015\)](#)” and “[Second Regulatory Period \(2016–2019\)](#)”, the regulatory approaches and the respective outcomes with reference to the first and second regulatory periods are illustrated; Section “[Non-regulatory Outcomes of Independent Regulation](#)” contains some observations related to the other outcomes achieved by means of independent regulation; and Section “[Next steps](#)” reports the next regulatory steps to be considered.

**Keywords** Independent regulation • Multi-level governance • Regulatory matrix Price cap • 9 factor • Infrastructure investments

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The views expressed in this paper are those of the author and do not necessarily represent those of AEEGSI. This paper benefited from the professional results achieved, and from the considerable workload accepted, by people involved in the Water Directorate of AEEGSI, whose acronym is DSID.

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## The Reasons for the Innovative Approach in Legislation

In 2011, the existing regulatory framework for water services was so unsatisfactory that: (a) the Italian Government proposed, in May, a reform of the surviving Water Committee, originally introduced in the comprehensive water reform of 1994, but never endowed with relevant powers and adequate staff; (b) the Italian citizens decided, in June, on massive participation in referendums,<sup>1</sup> abolishing a considerable part of the existing legislation and asking for further relevant changes, including proposal of a greater scope for public financing; (c) the President of the European Central Bank, at the beginning of August, together with the designated new President, asked the Italian Government for clarification regarding, among other things, how Italy intended to cope with referendum results and the macroeconomic and public-finance cycle.

The situation was not unexpected for water-sector experts, since signs of difficulties had been reported and analysed for a long time before 2011. The reform adopted in 1994 was only partially implemented, leaving a large part of the country in a never-ending transition period. Decisions envisaged by the reform, even those attributed to central bodies, were not adopted on time or not adopted at all. At the local level, the attitude within politics towards preserving the traditional influence in water service management generally prevailed over the will to change. The Regions that proved most advanced in the implementation of the reform were considered the exception, rather than the rule.

Even if we consider the most advanced Regions, there were increasing problems. Water regulation was undertaken on a contractual basis, leaving the definition of the risk-sharing clauses among the parties to each entrustment contract. Tariffs were established on the basis of projected variables: capital expenditure (CAPEX), operating expenditure (OPEX) and water consumption. Since water infrastructure projects and public planning were the central part of the tariff mechanism, there was a need to assess, every three years, the coherency among planned variables and evidence-based outcomes. Consequently, an obligation was introduced to verify, every three years, any differences among projected and realized values, and additionally, with reference to risk-sharing clauses, to investigate whether the differences were due to end-users (e.g., reduced consumption) or water utilities<sup>2</sup> (e.g., cost inefficiency). Sectorial literature reported that the implementation of this obligation was highly unsatisfactory, with only a very minimal segment of the

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<sup>1</sup>*Referendum abrogativo*, June 2011.

<sup>2</sup>These are companies that have been entrusted to operate water services through an assignment contract. The process by which the contract is awarded (e.g., in-house or competitive process) and the ownership of the companies (e.g., fully local-government-owned, mix of public and private ownership, or, to a lesser extent, fully privately owned) can differ.

operators effectively becoming involved in the verification, reducing transparency and undermining the reputation of the parties.<sup>3</sup> As a result, there were many litigation cases between consumers—unwilling to pay for investments planned but not yet realised—and operators—asking for full recovery of actual costs. The sector outlook appeared disordered and uncomfortable.

The “Acqua pubblica” campaign took place in this context and brought results to the referendum in 2011, establishing that a fair rate of return should not be included in the water tariff calculations, and that the obligation either to partially sell 100% publicly-owned companies or to assign their entrustment contracts through auction procedures was to be abolished. Many observers were oriented to understand the results as a general remark on the limited trust that the public had in the water sector, considering both institutions and operators. Uncertainty over the future of the sector increased.

Knowledge of the water infrastructure was very poor, investments were very low, service quality provided to end-users was highly inhomogeneous, service suppliers numbered more than 2600—of which the most relevant portion, nearly 2000, consisted of municipalities directly managing local aqueduct or sewerage networks—and local governance was entangled in long-term contracts with obscure definitions of roles and liabilities. Moreover, the European Commission and European Court of Justice were asking that Italy significantly improve the reported unsatisfactory performances in waste-water treatment and function according to European discipline. The gap between the reality of the sector and the public-opinion desiderata was growing and becoming increasingly difficult to explain.

A few months later, the government proposed assigning water tariff regulation, standard contract design, monitoring and regulatory enforcement to an independent regulator, the Italian Electricity and Gas Authority. Parliament approved the proposal, changing the institutional framework for water services. Two years later, the regulator’s name was changed accordingly to the Independent Regulatory Authority for Electricity, Gas and Water (AEEGSI). The new institutional framework appeared to be in line with OECD recommendations on regulation.<sup>4</sup>

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<sup>3</sup>UTILITATIS (2011). ‘Blue Book. I dati sul servizio idrico integrato in Italia’.

<sup>4</sup>OECD (2011). See, in particular, p. 119: ‘Recommendations on water: ... Allow water companies to charge prices that fully reflect costs including the need to renew infrastructure over time. Social concerns should be dealt with using social policies... The existing national commission, Conviri, should become an independent national regulatory authority to monitor water supply and quality, including water that does not enter public distribution networks, enforcing competition rules (in conjunction with the Competition Authority) and quality standards. Its mandate should also include improving the reliability and comparability of statistics on water... Revisit national legislation on the structure of water pricing. Prices should be set as a function of the cost of supply and the level of demand, not as a function of the nature of the consumer, and should fully reflect the polluter-pays principle.’

## The New Regulatory Framework

Since the very beginning, Italian water services were organized at the municipal level, and all attempts to promote aggregation at the inter-municipal or regional levels found little acceptance. The sectorial legislation before 2012 was almost coherent with this situation. Since the institutive law, in 1995, the independent regulator had been envisaged as a central institution, independent from Parliament, Government and territorial administrations. The combination of these opposite settings—the first focused on local prerogatives and the second based on central powers and competencies—created the new regulatory framework. From this point of view, the legislative approach could be regarded as innovative, since there were principles and criteria, but the decision-making process concerning the water sector had to be reconsidered in order to balance local and central attributions.

AEEGSI was entrusted with competences on “regulation and control”: the first phase, regulation, is *ex ante* and involved general and specific forms of participation by all the stakeholders; the second phase, control, is *ex post* and is based on single formal procedures involving interested parties.<sup>5</sup>

Since the beginning,<sup>6</sup> AEEGSI has interpreted the proper definition of a detailed framework for a public decision-making process as a fundamental point of the new water regulation: the central regulator (AEEGSI) had to provide rules, mechanisms and procedures; local authorities (EGAs),<sup>7</sup> considering data and all of the other elements made available by operators, had to define proposals to be submitted to AEEGSI; AEEGSI then had to investigate the proposals, verify compliance with the rules, mechanisms and procedures, and then approve them (Fig. 1).

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<sup>5</sup>It appears to be not a simple exercise to encompass the reform adopted in Italy within the categories of Economic Theory of Regulation and, since this is not a theoretical paper, it is possible to report only few remarks. Economics provides some relevant insights on the decision related to when and how to set up independent regulators: under Public Interest Theories, the regulator is the part of the State in charge of overcoming market failures (market power, externalities and public goods, asymmetric information); within Private Interest Theories, the introduction of regulation is related to the protection of interests of private groups (i.e., producers, consumers, investors); the so-called Economic Theory approaches investigate the causes of the regulation using models of competition among interested groups or parties. The reported categories appear unable to explain the Italian approach, which seems considerably dependent on decision-process failures, both public and private, and is caused by specific forms of transaction/public-decision costs.

<sup>6</sup>It is worth mentioning that AEEGSI started immediately to work in the water field also at international level and was the main promoter of Wareg, the association of water regulators.

<sup>7</sup>Ente di Governo dell’Ambito (EGA) is the legal entity in charge of public functions of planning and tariff proposal for a specific territory, delimited by regional legislation following criteria of homogeneity (Ambito Territoriale Ottimale, ATO). All the municipalities included in the ATO perimeter have the legal obligation to participate in the EGA and to exercise their administrative attribution together within the EGA. This provision was introduced in 1994 and was not uniformly implemented throughout the country, since many municipalities wanted to preserve their historical prerogatives in the water sector and, as it turned out, certain Regions and the Government were unable to force them to comply with the reform.

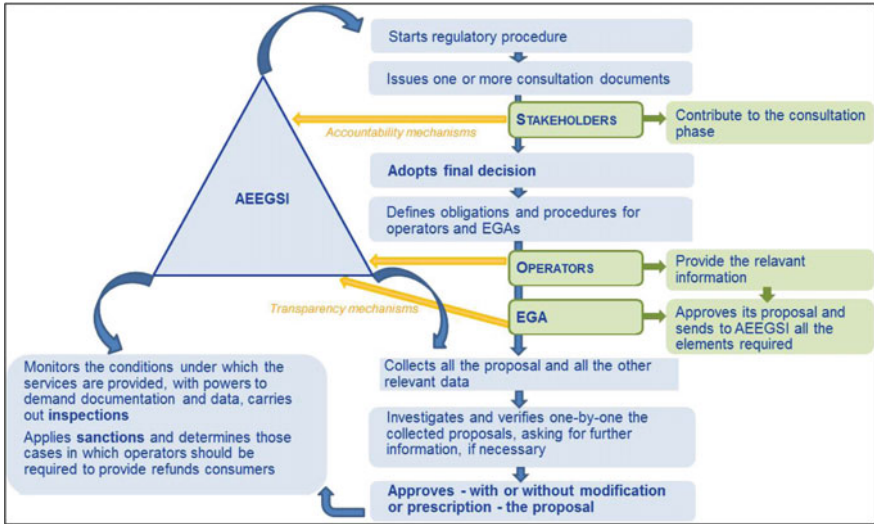


Fig. 1 Decision-making process

The governance framework is a determinant in the design of rules, mechanisms and procedures, influencing almost all of the classic pillars that form the regulatory architecture (OECD 2014):

- Revenue and tariff calculation, determining caps both on revenue and on end-user tariffs;
- Contractual quality discipline, identifying thresholds for service standards to be provided to end-users;
- Technical and infrastructural quality regulation, defining lower limits for technical and infrastructural standards to be granted to end-users;
- Unbundling and information feedback, disentangling accounting information to fulfil the needs of regulation;
- Consumer protection, defining roles and procedures or verifying specific issues identified by end-users to promote the protection of consumer rights;
- Enforcement, introducing systematic investigation to verify the compliance of operators and EGAs with the regulation.

With specific attention to the first three bullet points (revenue and tariff, contractual quality, technical and infrastructural quality), it is possible to compose a brief illustration of the decision-making process at the local level.

In application of primary legislation, AEEGSI adopted a comprehensive definition of a tariff proposal, called the “specific regulatory scheme,” to be adopted by EGAs, with the involvement of the service supplier, and to be detailed for a four-year regulatory period. The “specific regulatory scheme” includes:

- Financial and economic plan (FEP), specifying revenues, average tariff for end-users and all of the costs to be reimbursed to the supplier;
- Infrastructure and management programme (IMP), disentangling all of the relevant measures to be implemented in order to achieve the predefined quality objectives;
- Entrustment contract (EC), clarifying liabilities of the EGA and the service supplier according to the standard framework defined by AEEGSI.

The regulation via the “specific regulatory scheme” promotes an integrated approach, in which evidence-based information, both on accounting data and on technical and contractual parameters, is combined with the objectives to be achieved and with the corresponding envisaged measures, in a framework in which the roles and liabilities of the parties are clarified.

The roadmap to the adoption of the “specific regulatory scheme” can be summarized as follows:

- EGA, interacting with the service supplier, starts from evidence based on the accounting results, with reference to the typology of costs considered for regulation and to parameters related to critical issues of infrastructure or service standard provisions;
- EGA, interacting with the service supplier, verifies the legally binding parameters to be included among the objectives to be achieved and, accordingly, elaborates the IMP in which such parameters are included as priorities, and the FEP in which the economic and financial viability of operators is verified;
- in the most advanced contexts, EGA evaluates the additional costs, both operating and capital, to be considered in order to improve current performance, even if they are above the lower limits, and, accordingly, coordinates IMP and FEP;
- EGA and the service supplier transpose AEEGSI regulation in the EC, assuring their formal agreement of compliance with the new rules.

Therefore, the elaboration of the “specific regulatory scheme,” combining evidence-based elements with the objectives to be fulfilled by management activities, represents the opportunity to evaluate simultaneously all of the relevant factors within an iterative procedure (for example, if a modification of IMP is not economically or financially sustainable by the FEP, it should be revisited). Once the scheme is completed, usually within the time period defined by AEEGSI, it is formally approved by the EGA and proposed to AEEGSI for final deliberation. AEEGSI verifies the scheme, asks for clarification or integration and, finally, approves it with or without modifications. The approval of the scheme equals approval of the comprehensive proposal. AEEGSI regulation provides for penalties in case the EGA and/or the service supplier do not fulfill their obligations.

## First Regulatory Period (2012–2015)<sup>8</sup>

### *Setting the Regulation*

In early 2012, the regulatory activity of AEEGSI began by focusing on the following areas of intervention: (i) setting tariffs; (ii) setting compulsory standards for quality of service with incentives, penalties and refunds; (iii) setting conditions for service supply and contracts; and (vi) setting rules for accounting unbundling.

In 2012, AEEGSI published several consultation papers on tariff regulation. By the end of that year, Decision 585<sup>9</sup> was adopted, introducing a significant change: an ex-ante method of tariff calculation (i.e., using expected cost) was turned into an ex-post method (in which the inputs relevant to the calculation were measured). To promote efficiency, an overall cap on revenues was introduced; OPEX based on controllable outturn OPEX in a base year was rolled forward; and standardised parameters for the ‘reimbursement’ of fiscal and financing costs to operators were established on a notional basis. At the same time, AEEGSI concluded a procedure to reimburse consumers for the difference between the allowed return on capital included in the tariff (charged by water service operators under pre-referendum regulation) and the notional fiscal and financing costs. Overall, this increased regulatory transparency and the sector’s accountability.

In 2013, AEEGSI began consulting on identifying the long-term objectives of regulation, and examined a new tariff mechanism in which all of the relevant features of the Italian water sector would be considered. Decision 643 (the so-called MTI) was adopted at the end of the year, centred on the ‘Regulatory Matrix.’<sup>10</sup> This allowed for regulation to vary depending on the initial operating circumstances of each operator, taking into consideration, at the same time, the need for investment promotion and the objective of rationalizing, by means of restructuring and integrating, the water service supply side. The overall framework was designed to introduce a set of innovative and asymmetric rules, which provided incentives for investment and the rationalization of operating activities. In order to identify the specific rules applicable to tariff calculation, the MTI considered two key elements:

- the ratio between the planned investment expenditure and the regulatory asset base (RAB)—if this ratio was above a certain threshold, it would be possible to apply rules to achieve higher cash flows; and

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<sup>8</sup>To some international observers, it may appear strange that the regulatory period started while the regulation was still yet to be defined. AEEGSI considered this issue with pragmatism: the first regulatory period was divided into two two-year sub-periods, with the first devoted to data collection and the implementation of a transition tariff mechanism, and the second dedicated to the first introduction of the new regulation.

<sup>9</sup>AEEGSI (2012a), Decision 585/2012/R/IDR ‘Regolazione dei servizi idrici: approvazione del metodo tariffario transitorio (MTT) per la determinazione delle tariffe negli anni 2012 e 2013’.

<sup>10</sup>AEEGSI (2013).

- the expansion of activities to be managed by the operator, considering both technical and territorial perimeters—if new activities had to be managed (being new municipalities or new infrastructures), their costs had to be recovered and, therefore, included in the allowed revenues.

The combination of the two elements determined the four possible sets of rules (regulatory schemes):

- Scheme I was related to situations in which the need for investment compared to the existing regulatory asset base was not substantial and the perimeter of operation remained unchanged;
- Scheme II was different from Scheme I because of the modifications in the area served by the operator, e.g., new municipalities were to be included in the perimeter, and/or new infrastructures were to be managed, e.g., new treatment plants were starting to operate; in this case, given the rolling cap on OPEX related to existing activities, the operator might recover the additional OPEX corresponding to new operating activities;
- Scheme III was different from Scheme I because of the relevant need for investment compared to the existing RAB, while the territorial and/or technical perimeter remained unchanged; in this case, the operator might finance investment expenditures by means of higher depreciation rates, anticipation by consumers and a higher limit on the tariff increase;
- Scheme IV addressed the situation in which the two effects—investment needs and perimeter variations—were simultaneous; in this case, conditions introduced with reference to Schemes II and III were cumulative.

On the basis of the value of the RAB and the objectives considered at the local level, it was possible to select the scheme. The selected scheme provided the proper cost-reimbursement rules for the calculation of infrastructure/investment costs and for the evaluation of possible additional operating costs. Given the scheme, it was possible to calculate the total amount of costs and, then, to determine the tariff multiplier,  $\vartheta$ . This was calculated as the ratio between the allowed amount of cost recovery expected in one year and the revenue corresponding to the tariff applied in the base year. Once  $\vartheta$  was determined, it was multiplied for all existing end-user tariffs, in order to calculate, *ceteris paribus* the scale variables (for example, typology or number of consumers, volumes), a tariff structure coherent with the total amount of costs to be recovered.

By algebraic construction, posing a cap on the increase of  $\vartheta$  established a twofold limit: a revenue cap, since, given the denominator of the  $\vartheta$  ratio, a limit on  $\vartheta$  was a limit on the numerator (the expected revenue), and, at the same time, a price cap, because all of the end-users' tariffs had to be multiplied by a capped  $\vartheta$ -factor. The cap was defined on the basis of the estimated retail price index variation, increased by the K-factor or by 1.5 times the K-factor, depending on the investment needs (in the second row of the matrix, with reference to Schemes III and IV, where



	NO CHANGE IN TECHNICAL OR TERRITORIAL PERIMETER OF THE OPERATOR	CHANGES IN TECHNICAL OR TERRITORIAL PERIMETER OF THE OPERATOR
$\frac{\sum_{2014}^{2017} IP_t^{exp}}{RAB_{MTT}} \leq \omega$	<p><b>SCHEME I</b></p> <p>Limit to price variation:</p> $\frac{\vartheta^a}{\vartheta^{a-1}} \leq (1 + rpi + K)$ <p style="text-align: right;"><b>6.5%</b></p>	<p><b>SCHEME II</b></p> <p>Limit to price variation:</p> $\frac{\vartheta^a}{\vartheta^{a-1}} \leq (1 + rpi + K)$ <p style="text-align: right;"><b>6.5%</b></p>
	<p><b>SCHEME III</b></p> <p>Limit to price variation:</p> $\frac{\vartheta^a}{\vartheta^{a-1}} \leq [1 + rpi + 1,5 \cdot K]$ <p style="text-align: right;"><b>9.0%</b></p>	<p><b>SCHEME IV</b></p> <p>Limit to price variation:</p> $\frac{\vartheta^a}{\vartheta^{a-1}} \leq [1 + rpi + 1,5 \cdot K]$ <p style="text-align: right;"><b>9.0%</b></p>
$\frac{\sum_{2014}^{2017} IP_t^{exp}}{RAB_{MTT}} > \omega$		

Fig. 2 Tariff setting in the first regulatory period Source AEEGSI (2013)

investment needs are higher, the K-factor was multiplied by 1.5)<sup>11</sup> (the maximum increase for each scheme is shown in the box in Fig. 2).

### Outcomes of the First Period

The introduction of the “Regulatory Matrix” paved the way to a clear, stable and coherent regulatory framework, consistent with the multifaceted characteristics of the water sector in Italy. The tariff-setting methodology—and the related regulatory actions—for the years 2014–2015 proved to be effective<sup>12</sup>:

- tariff proposals approved by AEEGSI for 2014–2015 applied to 1978 operators, affecting around 54 m Italian citizens. The average increase in charges from the previous year was nearly 4.4% in 2014 and 4.6% in 2015;<sup>13</sup>
- for 143 industrial operators (serving 45 m customers), AEEGSI approved tariff proposals consistent with planned investments, amounting to approximately €5.9 bn for the four-year period from 2014 to 2017;

<sup>11</sup>Standardized financial viability of operators was considered in the calculation of Financial and Fiscal Costs, in the CAPEX formula.

<sup>12</sup>See AEEGSI Annual Report, 2017a([http://www.autorita.energia.it/allegati/relaz\\_ann/17/RAVolumeII\\_2017.pdf](http://www.autorita.energia.it/allegati/relaz_ann/17/RAVolumeII_2017.pdf)).

<sup>13</sup>The remaining part of the country, corresponding to 10% of the population, is managed by operators whose tariff proposals are still under review.

- investments (net of public contributions) for the years 2014 and 2015 reported considerable growth, with an increase of 55% recorded in 2015 compared with 2012.

Owing to long-lasting procedures for authorizing public works connected to investments, delays in the availability of public funds or, in one situation, uncertainty with reference to the expiry date of the entrustment contract, the realization rate of the planned investments was around 80%, and, for each case in which the rate was below 100%, AEEGSI collected information and specific reports to verify the underlying causes.

The largest part of the investments dealt with the infrastructure gap in sewerage and sewage-treatment activities on the basis of the priorities defined by the individual EGAs (in agreement with the operators). The overall amount of investment appeared to be both an encouraging result, when compared with the previous period, and, at the same time, an unsatisfactory one, when compared with international benchmarks (€33 per capita per annum seems insufficient for investment in water distribution, sewerage networks and treatment plants). In certain areas of the country, the transition from a model in which the financing of investments relied on public funds to a paradigm based on financing by end-user tariffs proved to be difficult.

Other relevant outcomes were related to: (a) the beginning of the rationalization process, both on the demand side, with a reduction in the number of EGAs, and on the supply side, with a decreasing amount of operators; (b) the creation of a large dataset, (c) the definition of a common model for infrastructure and management planning, with a uniform set of critical issues, technical parameters and objectives, (d) the introduction of a first set of quality KPIs, (e) the definition of anti-default mechanisms coherent with the comprehensive regulatory framework. The data collected and—in certain areas of the country—the reported impossibility of collecting data demonstrated that the differences among costs, management capabilities, state of infrastructures, and consumer trust of suppliers were much, much higher than expected.

## **Second Regulatory Period (2016–2019)**

In December 2015, AEEGSI approved a new and comprehensive regulatory package for the second regulatory period, composed of three elements:

- the method for defining cost reimbursement rules and tariff calculation mechanisms (MTI-2);
- the regulation of contractual quality (i.e., quality of direct customer services such as complaint-handling, call response, connection time, etc.), providing for a gradual harmonisation, throughout the country, of service standard parameters for end-users;

- the regulation of entrustment contract, approving a common framework for the allocation of legal obligations among EGAs and water service operators.

This new and comprehensive regulatory package represents a coherent and broad legal framework.

### ***Cost-Reimbursement and Tariffs***

Under MTI-2,<sup>14</sup> as under the original MTI, the selection of applicable cost-reimbursement rules depends on the specific circumstances characterizing the area to be served, which place the operators in one of the six Schemes in the new Regulatory Matrix for the period 2016–2019.<sup>15</sup> The Scheme is selected by the EGAs according to:

- the ratio between the planned investments (IP) for the period 2016–2019 and the regulatory value of the existing infrastructure (RAB):
  - Schemes I, II and III are characterised by lower investment needs going forward;
  - Schemes IV, V and VI are suitable for relevant investments, which are identified according to the operator’s objectives;
- the OPEX relating to the operator’s specific objectives, where:
  - Schemes I and IV (for more efficient operators, with per-capita OPEX below the national average value, OPM) and Schemes II and V (for operators with per-capita OPEX greater than OPM) are characterised by unchanged specific objectives and scope of activities;
  - Schemes III and VI are applicable in the event of a structural change in the activities, in terms of area served or the scope of supplied services, leading to additional costs being incurred by the operator. The reason behind these schemes is the new legislation that requires existing operators to merge such that for each EGA’s area, there will be one operator providing water services. The Regulatory Matrix considers this obligation, providing for more favourable rules for merging parties.

The  $\vartheta$ -factor is calculated following the same procedure illustrated in the previous section, with the main difference concerning the determination of the cap, which is defined on the basis of the estimated retail price index variation, a K-factor—taking into account the investment needs—and a new variable, the X-factor, a distributive efficiency-sharing factor (Petretto 2017) (the maximum growth for each scheme is shown in the box in Fig. 3).

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<sup>14</sup>AEEGSI (2015c).

<sup>15</sup>MTI-2 has also introduced some relevant incentives for quality performance; however, this is beyond the scope of this article.

		NO VARIATIONS IN THE OPERATOR'S OBJECTIVES OR ACTIVITIES		PRESENCE OF VARIATIONS IN THE OPERATOR'S OBJECTIVES OR ACTIVITIES: - WATER SYSTEM INTEGRATION - IMPROVEMENTS IN QUALITY
		$\frac{Opex^{2014}}{pop} \leq OPM$	$\frac{Opex^{2014}}{pop} > OPM$	
INVESTMENTS	$\frac{\sum_{2016}^{2019} IP_t^{exp}}{RAB_{MTI}} \leq \omega$	<b>SCHEME I</b> Limit to price variation: $\frac{\vartheta^a}{\vartheta^{a-1}} \leq (1 + rpi + K - X)$ <b>6.0%</b>	<b>SCHEME II</b> Limit to price variation: $\frac{\vartheta^a}{\vartheta^{a-1}} \leq (1 + rpi + K - 2 \cdot X)$ <b>5.5%</b>	<b>SCHEME III</b> Limit to price variation: $\frac{\vartheta^a}{\vartheta^{a-1}} \leq (1 + rpi + K)$ <b>6.5%</b>
	$\frac{\sum_{2016}^{2019} IP_t^{exp}}{RAB_{MTI}} > \omega$	<b>SCHEME IV</b> Limit to price variation: $\frac{\vartheta^a}{\vartheta^{a-1}} \leq (1 + rpi + 1,5 \cdot K - X)$ <b>8.5%</b>	<b>SCHEME V</b> Limit to price variation: $\frac{\vartheta^a}{\vartheta^{a-1}} \leq (1 + rpi + 1,5 \cdot K - 2 \cdot X)$ <b>8.0%</b>	<b>SCHEME VI</b> Limit to price variation: $\frac{\vartheta^a}{\vartheta^{a-1}} \leq (1 + rpi + 1,5 \cdot K)$ <b>9.0%</b>

Fig. 3 Tariff setting in the second regulatory period Source AEEGSI (2015c)

### Contractual Quality

AEEGSI launched consultations for the harmonisation of service standard parameters to be provided to end-users, after which several monitoring activities on effective quality standards in use provided evidence that there were considerable differences among operators the underlying reasons for which were not clear. In December 2015, the decision was adopted introducing common contractual quality standards, establishing 43 parameters to be granted to end-users as minimum levels of performance.<sup>16</sup>

The new regulation provided instruments for achieving minimum levels for disadvantaged providers and improving the performance of excellent operators: the first was promoted by the provision of additional resources to be dedicated to quality improvements, the second was incentivized by envisaging an award/penalty mechanism reserved for operators performing above the minimum levels. In both cases, the new service parameter to be achieved became an objective in the IMP and the related eligible costs were included in the FEP.

Even in this area, the role of the EGAs is fundamental, as they possess greater information regarding the specific context, the consumers' *desiderata* (also in terms of willingness to pay) and supplier performance, so that they are able to identify the needs of local communities and the demand for a quality of service higher than the minimum national standard.

<sup>16</sup>AEEGSI (2015a).

## *Regulation of Entrustment Contract*

AEEGSI has also introduced a standard set of rules and clauses to be transposed in the contractual relations between local authorities and operators.<sup>17</sup> Given the governance framework, it is an important instrument for defining the roles and liabilities at a local level and ensuring certainty of legal procedures and efficacy of the general regulatory framework. In particular, the regulation of EC sets: (i) the maximum duration of public concessions and conditions for their possible extension; (ii) instruments and procedures to ensure the financial viability of operators; (iii) terms and procedures for asset payment at the end of the concession (terminal value); and (iv) risk-sharing among operators and local governments, which is diversified according to the operators' selected organisational model.<sup>18</sup>

## *Preliminary Outcomes of the Second Period*

The outcomes of the second regulatory period will probably not be available before 2020, delaying a comprehensive evaluation of the regulatory package adopted in December 2015, but limiting attention to the activities that took place from the beginning of 2016 to September 2017, it is possible to illustrate some preliminary results:

- the new regulatory matrix proved to be consistent with the multifaceted issues of the water sector, as is possible to verify in Fig. 4, in which schemes with considerable investment needs and, to a lesser extent, those envisaging a significant integration process were widely selected by EGAs;
- tariff proposals approved by AEEGSI for the period 2016–19 apply to 145 operators,<sup>19</sup> affecting around 36 m Italian citizens. The average increase in charges from the previous year was nearly 4.6% in 2016, 6.6% in 2017, 2.4% in 2018 and 1.2% in 2019<sup>20</sup>;
- for the period 2016–2019, expected investments financed by tariffs amount to € 7.8 bn, corresponding to a national average value of 167 €/inhabitant<sup>21</sup> (see Fig. 5);
- considering all of the proposals sent to AEEGSI, including those still under scrutiny, total planned investments amount to €9.9 bn for the four-year period

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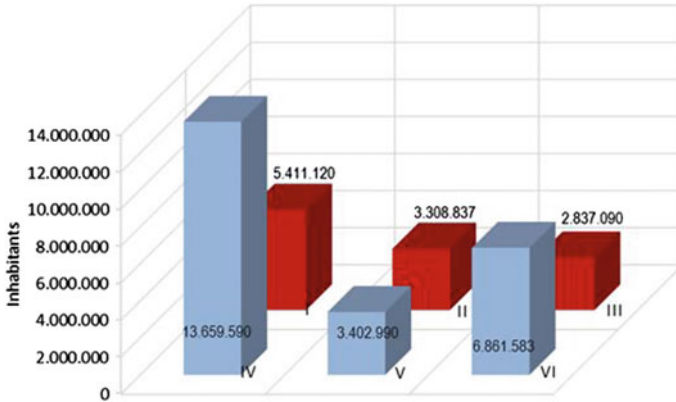
<sup>17</sup>AEEGSI (2015b).

<sup>18</sup>For example, assignment by competitive process, Institutionalised Public–Private Partnerships (PPP paved the way to a clear, stable and coherent ), or in-house provision.

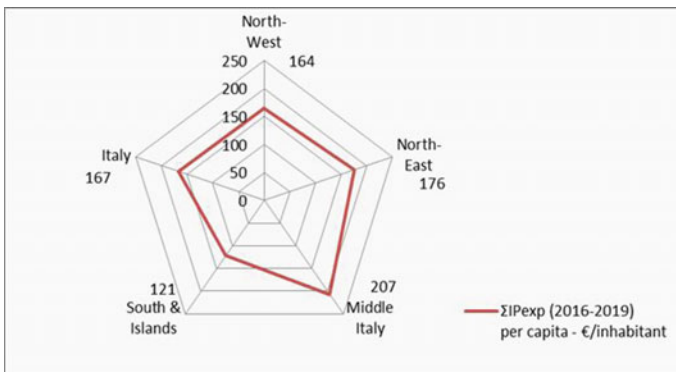
<sup>19</sup>For 109 industrial operators (serving 35 m customers), AEEGSI approved tariff proposals consistent with planned investments.

<sup>20</sup>See AEEGSI Annual Report, 2017a, b ([http://www.autorita.energia.it/allegati/relaz\\_ann/17/RAVolumeL\\_2017.pdf](http://www.autorita.energia.it/allegati/relaz_ann/17/RAVolumeL_2017.pdf)).

<sup>21</sup>Sample of 130 operators serving 46,663,760 inhabitants.



**Fig. 4** Population distribution per selected regulatory schemes [Sample of 109 operators (serving 35,481,210 inhabitants), interested in the AEEGSI specific regulatory scheme approved until May 31, 2017.]



**Fig. 5** Net expected investments 2016–2019 (per capita)

(from 2016 to 2019), including the contribution of public funds (estimated as €2.1 bn for the same period). See the dynamics of planned investments shown in Fig. 6;

- at a national level, investment needs for the water sector for the period 2016–2019 reaches €12.7 bn (€3.2 bn yearly);
- the increase in investment expenditures, combined with acquisitions of activities of small municipalities, induces a steady growth of the regulatory asset base, as shown in Fig. 6;

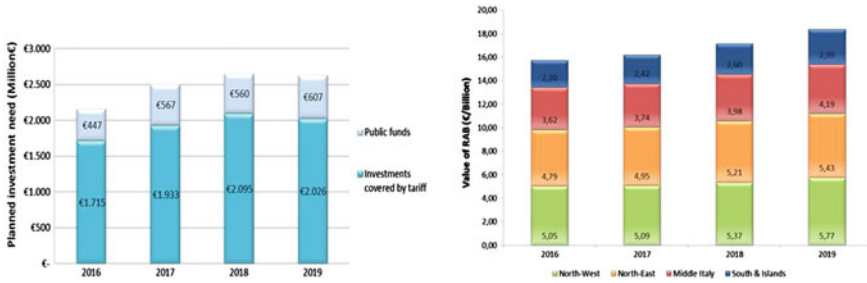


Fig. 6 Trend of planned investments for the period 2016–2019

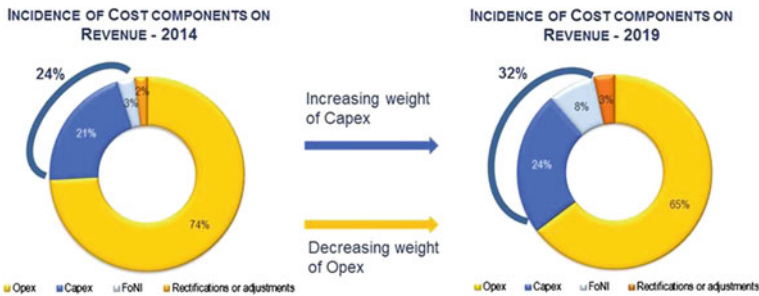


Fig. 7 Incidence of cost components on revenue

- the increase in investment expenditures, combined with a rolling cap regulation on the largest part of the operating cost,<sup>22</sup> originates a rebalancing of the incidence of cost components in total revenue, with a steady growth of the weight of CAPEX and a constant decrease of the weight of OPEX, as shown in Fig. 7.

## Non-Regulatory Outcomes of Independent Regulation

Sections “[First Regulatory Period \(2012–2015\)](#)” and “[Second Regulatory Period \(2016–2019\)](#)” report the outcomes achieved in the regulatory periods, but there are further results that can be considered dependent, directly or indirectly, on the

<sup>22</sup>In AEEGSI regulation, operating costs can be classified in two categories: endogenous (given the duration of the regulatory period, they fall under the responsibility of the supplier) and pass-through (given the duration of the regulatory period, they are exogenous for the supplier). The first category is determined on the basis of current values reported in the year 2011, upgraded with the expected inflation rate (Rolling-Cap regulation), while the second category is adjusted on a two year basis, considering the effective ex-post values reported by accountancy (Pass-Through Regulation). In the first category are included 2/3 of the total operating cost, and in the second category, the remaining 1/3: this is the reason underlying the assumption that, in the new regulation, operating costs are under efficiency pressure.

introduction of the new regulation. Those that deserve to be mentioned are the following:

- Sectoral legislation changes the paradigm, and, after a long period of political debate concerning new sweeping reforms for the water sector and researches analysing alternative scenarios, sometimes without adequate consideration of sector resilience, a new phase has started, in which attention has been focused on specific critical issues (i.e., implementation of regional and local governance, clarification of the rights to water and protection for socially disadvantaged users, definition of methods for reducing late payments), contributing to improvement of the efficacy of the new framework;
- The National Government, also thanks to the availability of new datasets and in light of the regulatory results, demonstrates a reinforced capability in dealing with the European Commission, as was proved by the adoption of a comprehensive approach to environmental and resource costs and by the start of new State initiatives for the improvement of waste-water treatment facilities;
- Regional legislation changes the paradigm, and the screening of the legal solutions proposed was reinforced, contributing to clarification of the competences of both the State and the Regions;
- EGAs were substantially rationalized and improved, leading to a reduction in their number—decreased from 91 in 2011 to 64 in 2017, with the prevalent adoption of the model of one EGA per Region, introduced in 12 out of 20 Regions—to a reinforcement of their functions and competences and to an upgrade in the quality of their technical staff;
- Water utilities were considerably restructured, with their total amount decreased from more than 2600 in 2011 to nearly 2100 in 2017 (most of them, about 1300, still present in the South of the country), within a process of continuous rationalization and acquisition of infrastructures directly managed by municipalities through the water utility operator.

The previous illustration suggests a twofold message: the importance of the processes started in the water sector on one side, and the extent of the activity that has yet to be implemented on the other side. But the direction of the processes appears clear, consistent and consolidated.

## Next Steps

AEEGSI is elaborating two further disciplines to be introduced into the water sector in 2018: the reform of end-user tariff criteria and the definition of infrastructural and technical quality. These documents<sup>23</sup> will contribute to the completion of the design of sectoral regulation.

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<sup>23</sup>See AEEGSI (2017c, d).



## ***Reform of End-Users Tariff Criteria***

The regulation on cost-reimbursement rules proved to be essential in promoting transparency in the cost structure, efficiency and steady growth of investment expenditures, although focused on the supply side. The perception of the effect of the reform was delegated to linear variation of existing tariff structures, through the  $\vartheta$ -factor.<sup>24</sup>

Existing tariff structures, nevertheless, do not appear satisfactory, because of underlying political economy-created cross subsidies and limited cost reflectivity. Moreover, new legislation was approved demanding clear and transparent actions in favour of socially disadvantaged end-users and, on another side, European legislation concerning “polluters’ pay principle” may induce a further reassessment of pricing. The need for a new regulatory initiative appeared clear.

The main elements of the reform are the following:

- Definition of a fixed and variable tariffs, establishing an incidence of the former no higher than 20% of the total expenditure;
- Definition of variable tariffs on the basis of an increasing block model, but limiting the degree of progressivity and homogenizing the consumption intervals to be considered;
- Introduction of per-capita application of the tariff structure, to protect large families;
- Refinement of criteria for the differentiation of tariffs for different users in light of their environmental impact.

## ***Infrastructural and Technical Quality***

The discipline of infrastructural and technical quality is a fundamental element for completing the regulatory toolbox. The long-term objective is to identify a set of parameters able to illustrate the main characteristics of the service provision. If this objective can be achieved through an exhaustive and unbiased set of measurable indicators, then it will be possible to adopt an advanced mechanism for output-based regulation.

But even the short-term implementation can introduce relevant improvement into water management performance. To strengthen the perception of end-users, AEEGSI has already identified five macro indicators, defined as standard values of parameters to be achieved in a given period of time and composed of sub-indicators able to illustrate the efficacy of the actions taken. The macro-indicators illustrated by AEEGSI are the following:

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<sup>24</sup>See Section “[First Regulatory Period \(2012–2015\)](#)”.

- Leakages
- Continuity of supply
- Quality of water resources supplied
- Storm sewage overflows
- Sludge disposal.

In other words, AEEGSI intended to promote a model of water utility with a better attitude in managing existing water networks, a greater reliability for end-users, both in terms of continuity and quality of resources, an improved management capability in sewerage networks, and progressively reduced environmental impact in waste-water treatment. As a short-term set of parameters, it could appear challenging. To enforce rapidly the first step of the reform, there is the provision of a legal obligation to consider the illustrated macro-indicators as priorities for the next infrastructure and management plan.

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