oxera
compelling economics

Agenda
Advancing economics in business

Slowly but surely: introducing water service quality regulation in Italy

Regulating quality of service can be an essential part of the utilities regulation framework. But it is likely to present challenges, especially when regulation is in its early stages, as is the case in Italy. What are these challenges in relation to the Italian water sector, and what principles and approaches can be used to address them?

Quality of service occupies a central but sometimes overlooked role in the regulation of network industries. If incentive regulation were applied exclusively to prices, companies could arguably obtain monetary benefits at the expense of service quality (although empirical evidence does not always support this view).[1] For example, companies could gain from retaining the benefits of reductions in operating expenditure achieved through lowering service standards rather than improving their efficiency. The conventional wisdom is therefore that economic regulation of utilities has to cover both price and quality dimensions.

Designing a regulatory framework that provides firms with adequate incentives to achieve an optimal level of service quality poses challenges. Without an understanding of how customers value different service quality levels and how much it costs to deliver these service levels, the regulator would find it difficult to ascertain the optimal level. This would require the regulator to create mechanisms and incentives to overcome the asymmetry of information between the regulator, firms and customers, by promoting, for example, the development of accurate measurement of costs and performance, understanding customer valuations, and setting attainable targets (i.e. targets aligned with what customers want and are willing to pay for). Moreover, the challenges may be exacerbated where the industry structure is highly fragmented and characterised by significant organisational and operational differences across territories and firms. This is the situation of the Italian water industry, where the regulatory authority for the energy sector, AEEGSI,[2] has been given a mandate for extending its jurisdiction to the water and sewerage industry, including introducing service quality regulation for the first time.

This article considers the challenges that may arise when introducing service quality regulation, especially in a context such as that characterised by the Italian water sector, and outlines an approach that could be used to overcome these challenges.

Understanding the challenges of introducing service quality regulation

Good practice suggests that the following high-level principles should help in establishing service quality regulation.[3]

- Service quality incentives should be focused on factors that can be influenced by the company and its management.
- Regulation should target only areas where there is clear evidence that the service in question is of material importance to customers.
- Incentives should be designed so as to minimise the potential for unintended consequences.
- There needs to be (sufficiently accurate) data to measure the company's performance against its service quality targets in a robust and consistent manner over the time period in question.

In practice, the application of these principles may create some challenges in introducing service quality regulation.[4]

The role of management performance

First, the level of service quality delivered may be due only in part to a company's management performance. For example, low levels of service quality, or significant variance

in quality across companies or regions, may largely result from the state of the network transferred to the regulated companies, the level of investments allowed by the regulator over time, and factors that are outside management control (e.g. those related to operating conditions such as the type and availability of water resources, topography, and population density). In Italy, for example, the water and sewerage industry has historically been regulated through concession contracts between companies and local municipalities, detailing both the levels of services to be guaranteed and the penalties when those levels are not met. Not surprisingly, this appears to have resulted in substantial regional differentiation in terms of quality of service. The box below provides an overview of the Italian water industry.

The Italian water industry

The water industry in Italy is highly fragmented, with approximately 3,000 companies providing water services.[1] Of these, 114 provide water and sewerage services to 69% of the population. This group is subject to legislation that began with the 1994 'Galli' law, which divided the country into administrative areas for water and sewerage services. Although superseded by subsequent legislation, this law still has a bearing on the current industry structure.[2]
Companies vary substantially in size. For example, the think tank, Utilitatis, reports that, of 220 companies, around 13% have a turnover above €50m a year, 41% between €50m and €5m, and 45% below €5m.[3]
The legacy network and investment carried out by companies have resulted in various levels of infrastructure development. For example, gross capital assets (as recorded in the financial accounts) range from €473 per inhabitant in the north-east of Italy to €143 in the islands, with a national average of €338.[4]
This variety may have contributed to differing levels of service. For example, the percentage of the population supplied with treatment processes ranges from 100% in Bologna to 40% in Palermo,[5] while leakages from water and sewerage networks are, on average, 41%, with much higher levels in the southern regions and islands.[6]

Note: [1] Estimate reported by AEEGSI (2012), 'Consultazione pubblica per l'adozione di provvedimenti tariffari in material di servizi idrici', 204/2012/R/Idr, May. [2] AEEGSI (2012), 'Consultazione pubblica per l'adozione di provvedimenti tariffari in material di servizi idrici', 204/2012/R/Idr, May, p. 11. [3] Utilitatis (2014), 'Blue e-Book: I dati del servizio Idrico Integrato in Italia', section 6, p. 7. [4] Utilitatis (2014), 'Blue e-Book: I dati del servizio Idrico Integrato in Italia', section 4, p. 105. [5] I.Stat data for 2011. [6] See AEEGSI (2013), 'Relazione annuale sullo stato dei servizi e sulla attività svolta', March, p. 260.
Source: Oxera.

In such a context, the regulator may face the challenge of increasing quality levels and promoting industry convergence towards them, while avoiding distortions when punishing or rewarding companies. On the one hand, the regulator has the objective of promoting service quality, which implies improving the average levels of service throughout the country and fostering the convergence of the worst-performing territories towards that average. For example, current quality of service levels in Italy appear to be low (e.g. water rationing is still in place in some areas of Italy, and, as noted in the box, there is a high level of leakage and the distribution of sewerage treatment facilities is uneven).[5] On the other hand, the regulator may be aiming for fair treatment of companies, whereby they are punished or rewarded only for service levels that are under their control. Specifically, this implies recognising that low and heterogeneous levels of quality may be strongly influenced by variables that are not fully under the control of companies.

If these factors are ignored, there is a risk of distortions. For instance, companies whose networks are in a better condition could benefit disproportionately, being rewarded beyond the actual merits of their management. Conversely, companies whose networks are in a worse condition could be penalised too harshly and in a manner not proportionate to their actual shortcomings.

Data availability

A second type of challenge relates to data availability, and particularly to introducing an incentive scheme that is effective in promoting service improvements while being feasible given the existing data constraints. When introducing service quality regulation, the available data is likely to be scarce and to vary widely across regions and companies. The ability of water companies to monitor leakages, for instance, depends on whether they have instruments for measuring the amount of water and wastewater that enters and exits the water and sewerage networks. In turn, this is affected by the legacy network and subsequent investments.

For any incentive scheme to be effective, it must be based on a set of measurable and reliable indicators. This implies that, when designing incentives—and, in particular, performance indicators—the regulator has to take into account both the data currently available and the data that is likely to become available in the future. The Italian experience shows that, while estimated current leakage levels (for instance) may suggest the need to adopt incentives in this area, heterogeneities across companies in terms of equipment to measure leakages may mean that it is not possible to immediately adopt any incentive on leakage reduction.

Customer priorities

A third type of challenge relates to the assessment of customers' priorities. Companies' efforts to improve services should be aimed at those areas that matter most to customers. At the same time, the costs of delivering service improvements should be commensurate with customers' willingness to pay for such improvements. Involving customer representatives in the regulatory process, and conducting research with a representative sample of customers, may be effective ways to gauge these priorities.[6]

Unintended consequences

Another type of challenge may arise from unintended consequences of incentive design. For example, companies could respond to an incentive to deliver a target level of service by considering the costs and benefits of *not* achieving that target. This entails a comparison of the financial costs of not delivering (the penalty that the company might be required to pay) and its financial benefits (avoided costs). If the level of the financial incentive is *not* set appropriately, not delivering may be the most beneficial course of action for the company, and therefore the incentive could result in a lower rather than a higher quality of service.

A gradual approach to implementing regulation

Given the challenges identified above, and in the context of markets such as the Italian water sector, a gradual approach to the introduction of service quality regulation may be consistent with the high-level design principles highlighted in the previous section.

First, in order to increase the levels of quality in the whole industry, while guaranteeing fairness in taking into account companies' different starting positions, the standard required might be differentiated for distinct clusters of companies, setting a trajectory of gradual convergence towards the industry-wide target. The allocation of companies into clusters would need to be based on criteria that ensure transparency and predictability for stakeholders. These criteria could include:

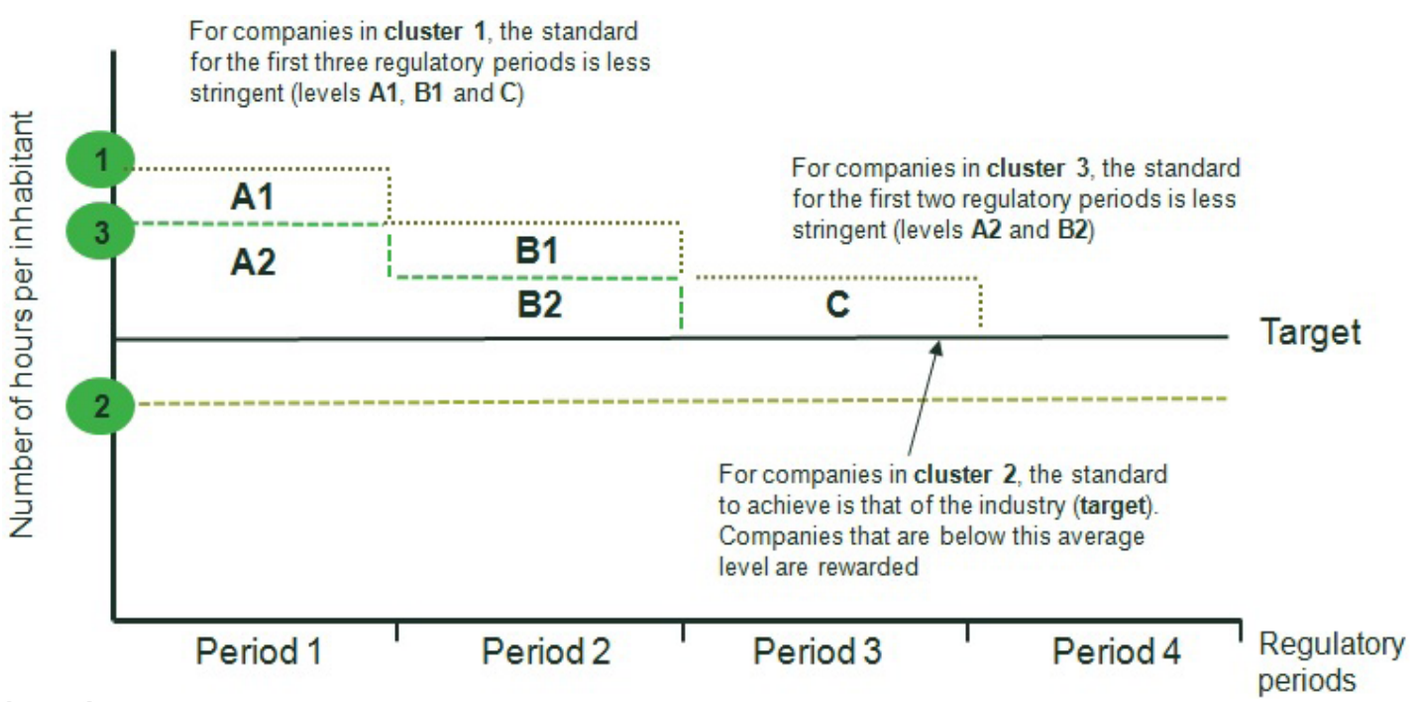
- the levels of service quality of a company at a given date;
- the level of actual investments compared with that planned by the company at the start of the investment cycle (e.g. at the start of the concession period), given that slow delivery of the investment programme might affect the level of service;
- population density, which is relevant for some of the quality standards that are based on the impact on the number of customers (for instance, unplanned interruptions).

Figure 1 shows how the clustering approach could be applied to unplanned interruptions in water supply.

In this example, companies are divided into three clusters that differ in their starting levels of unplanned interruptions (in terms of number of hours per customer). Since companies in clusters 1 and 3 have a higher level of unplanned interruptions than the target level, they would need to reduce this to catch up with the target. In contrast, companies in cluster 2 are below the target and would benefit from remaining there (i.e. from maintaining their service level at the high standard level and not 'deteriorating' to the target).

For the two clusters that need to catch up, the regulator could introduce a path to converge to a national standard and set intermediate targets accordingly. The companies furthest from the target (in cluster 1) could be given more time to achieve the targets.

Figure 1 The clustering approach



Source: Oxera.

Using clusters is, however, of little help when the industry has no information base for setting targets and assessing companies' progress against them. In such cases, a gradual implementation strategy might be appropriate. In the short term, such a strategy might be based on the following pillars:

- 'pilot indicators' are applied to all companies;
- the regulator identifies additional service quality indicators;
- companies propose to go beyond pilot indicators.

As a first step, a pilot indicator could be chosen on the basis of data availability, importance to customers, etc., and applied to the industry as a whole. In the case of the Italian water industry, for example, these pilot indicators could be continuity of supply in water and sewerage services, and the quality of customer services. The indicators should be immediately measurable for each company, and capture aspects of the service quality that are generally considered essential for consumers, such as continuity of supply.

The regulatory authority could then identify a list of additional service quality indicators; specify the requested data in order for these indicators to be used (AEEGSI has recently consulted on a number of service quality indicators—the outcome of this consultation could be used as a starting point to develop an additional list in the Italian case); explain which criteria the standards will be based on; define how to allocate companies into different clusters when setting targets for these indicators; and indicate the criteria for quantifying the value of the rewards and penalties and how to apply them.

Finally, companies could propose to be monitored on a number of additional indicators. They would propose indicators, standards and cluster allocation in line with those required in the regulator's guidance; and they would need to demonstrate that they possessed the relevent data.

In order to encourage companies to subject themselves to a higher number of indicators (thereby allowing an earlier test of service quality indicators), the financial incentives would need to be greater for those companies monitored under additional indicators than for those measured under only the pilot indicators.

In the medium to long term, the goal should be that an incentive scheme is applied to the entire industry. In the case of the Italian water industry, it might be appropriate to incentivise four separate areas of service: water supply, sewerage services, environmental quality, and commercial quality.

Expanding the incentive scheme would therefore imply the following.

- Learning from those companies that tested the additional indicators.
- Identifying the priority areas to incentivise, based on consumers' preferences.
- Determining the strength of the incentive according to the level of the financial reward or penalty. This could be on the basis of:
    - the incremental costs required to achieve given levels of service (cost-based);
    - customers' willingness to pay (value-based), which in turn requires an assessment of distinct consumer types' willingness to pay for different levels of service.
- Using the information on costs and value to customers, in order for the scheme to be compatible with incentives. Incentive compatibility would require the financial implications for the company to lie between the incremental costs of delivering a target level of service (the floor) and customers' maximum willingness to pay (the ceiling):
    - in this way, a company is incentivised to improve service (reaching the higher level of service gives them a benefit over and above the incremental costs allowed in tariff calculations);
    - at the same time, the penalty for non-delivery must be larger than the costs that the company is able to avoid by not carrying out the activities necessary to deliver a target level of service. If the penalty were equal to the avoided costs, this would not be a financial incentive per se; it would merely remove any incentive to avoid delivering the agreed services;
    - at the other end of the spectrum, the level of the incentive should not be above customers' willingness to pay, as this may result in companies delivering an inefficient level of service (where the costs to achieve this level are greater than its benefits).
- Defining a process for evaluating the potential impact of penalties on the financial and economic equilibrium (financeability) of companies.
- Designing a process for assessing the potential economic impact of the incentive on consumers (e.g. the implications of tariff increases and tariff stability for low-income customers).

Conclusion

A number of challenges may arise in introducing service quality regulation in an industry with widely differentiated service quality and availability of data. These include designing a regime that improves performance while also ensuring fairness, targets aspects that customers value, and applies to service aspects that are measurable and (largely) under the control of companies' management. Challenges may be exacerbated in a context such as that of the Italian water industry, where service quality is closely related to the level of infrastructure development, which is only partly under water companies' control. An adequate incentive structure and a gradual implementation strategy may provide a means for overcoming these challenges. Finally, even a gradual approach could fail if shortcomings and differences between companies in terms of infrastructure and information availability are not addressed. Thus, adequate investment incentives may also need to be in place. In other words, in a context such as that of the Italian water industry, incentivising good service quality goes hand in hand with incentivising strategic investments.

This article is based on an Oxera study carried out for FederUtility (the association of the local public services providers for water, gas and electricity) and a group of water companies.

[1] See, for example, Sappington, D. (2003), 'The effects of incentive regulation on retail telephone service quality in the United States', *Review of Network Economics*, **2**:4, pp. 455–75.

[2] Established in 1995, the Autorità per l'Energia Elettrica e il Gas (AEEG; now called AEEGSI to reflect the addition of water services to the sectors it regulates) was one of the first energy regulatory authorities created in Europe, and among the founding members of the Council of European Energy Regulators (CEER).

[3] See Oxera (2012), 'Outcome delivery incentive: options in setting future price limits in the England and Wales water industry', an independent report prepared for Ofwat, 15 August.

[4] Shortcomings in service quality are already subject to a form of regulation based on a service chart approach, whereby the company guarantees to meet certain standards and failure to do so entitles customers to ask for compensation. However, this may have limited incentive properties for companies. In contrast, the objective of the proposals outlined in this article is to provide companies with strong incentives to improve service quality.

[5] See I.Stat national statistics.

[6] See, for example, the role of Ofwat's Customer Challenge Group in setting prices in England and Wales for 2015–20, or the role played by the Customer Forum in Scotland. Ofwat (2013), 'Setting price controls for 2015-20 – final methodology and expectations for companies' business plans'; Water Industry Commission for Scotland (2013), 'Strategic Review of Charges 2015-21: Innovation and choice'. A summary of England and Wales water companies' use of research to elicit customers' willingness to pay (using a technique known as stated preference) is provided in UKWIR (2010), 'Review of cost benefit analysis and benefit valuation'.