

# Governance of local public service provision: between policy, efficiency and sustainability

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## Abstract

**Purpose** – Balancing economic efficiency and public governance is a challenge in the provision of local environmental services. This study aims to examine how alternative organisational arrangements may reconcile efficiency requirements with public control in light of circular economy objectives and incentive regulations.

**Design/methodology/approach** – Focusing on municipal solid waste and integrated water service management, this paper develops an analytical framework to examine potential welfare gains from integration. The study discusses an inter-municipal cooperation model centred on a utility, analysing how coordination, scale and governance interact.

**Findings** – The framework clarifies the relationships between service scale, governance capacity and social welfare. The analysis highlights potential economies of scale and scope while also identifying governance trade-offs associated with organisational expansion. Institutional arrangements based on coordinated public ownership can partially mitigate these trade-offs by supporting collective oversight and strategic alignment with circular economy objectives.

**Practical implications** – The framework clarifies the relationships between service scale, governance capacity and social welfare. The analysis highlights potential economies of scale and scope while also identifying governance trade-offs associated with organisational expansion. Institutional arrangements based on coordinated public ownership can partially mitigate these trade-offs by supporting collective oversight and strategic alignment with circular economy objectives.

**Originality/value** – This study offers an integrated analytical framework that links industrial organisation, public governance and sustainability, providing interpretative insights into emerging coordination models for environmental services.

**Keywords** Governance, Water management, Public services, In-house providing, Public economics, Waste management

**Paper type** Research paper

## 1. Introduction

As the economic debate has highlighted the shift from the traditional paradigm of public management to the new public governance perspective (Osborne, 2006), which focuses on producing services through collaboration between public, private and civil society actors (Krogh and Triantafillou, 2024), efficient provision of public services has regained momentum (Clifton *et al.*, 2019; Lorenz *et al.*, 2024).

Given that economic theory has traditionally assigned public intervention a role in correcting market failures, interventions in the economy through public enterprises (PEs) have been



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renewed by ideas that attribute to them the functions of guiding and promoting innovation (Patanakul and Pinto, 2014) and development (Adanma and Ogunbiyi, 2024). There has also been a growing interest in co-governance approaches that integrate public and private resources in innovative organisational configurations (Wang *et al.*, 2017).

A renewed vision is becoming increasingly prominent in today's context, which, along with circular economy (CE) goals, is characterised by recurring crises, geopolitical tensions and technological advancements. While PEs face challenges in ensuring adaptability and performance, markets struggle to achieve objectives that increasingly display the characteristics of public goods, thus calling for modern governance (Mazzucato, 2023).

In this context, local environmental services are increasingly assuming common goods characteristics. This applies to municipal solid waste (MSW) and integrated water service (IWS) management, whose performance and governance have system-wide externalities. MSW and IWS management are essential for social welfare and sustainability goals (Fiorillo and Merkaj, 2024; Kourtis *et al.*, 2019). From a CE perspective, the operational and technological synergies between the two sectors are significant. Therefore, analysing the two services jointly in terms of industrial efficiency, planning and governance is helpful.

Current regulatory requirements entail increasing demands in terms of organisational capacity, regulatory compliance and investment and performance objectives coordination.

Building on typical service delivery modes, i.e. in-house, inter-municipal cooperation, municipality-owned firm and private firm (Schoute *et al.*, 2018), this paper combines characteristics of in-house and inter-municipal cooperation. We developed our ideas by designing a three-player framework representing service providers, municipalities and society. The framework is operationalised through a business case, i.e. an inter-municipal aggregation for service provision, through which municipalities jointly organise public service provision. The model embeds a public utility that is assigned governance and operating roles to improve efficiency and integrate CE strategy. We discuss whether the proposed model can reconcile the efficiency of industrial operators with the need for effective public governance, thereby avoiding government failure, such as failing to resolve a market failure (Keech and Munger, 2015). The case proposed in this study addresses regulatory complexity, investment commitments and service performance management. The synergies discussed reflect the growing regulatory emphasis on technical and quality criteria.

The proposed configuration may be associated with a partial mitigation of outsourcing-related trade-offs, the emergence of technical and operational synergies and preservation of public governance. Indeed, the role assigned to territorially competent authorities in defining coherent territorial strategies underscores the importance of scale and coordination in organising MSW services. These insights inform reflections on institutional in local public services, particularly in contexts with similar structural characteristics. In this respect, integrating MSW and IWS management services appears to enhance policy coherence in environmental domains, with potential contributions to achieving CE goals.

However, the results of this article should be interpreted as an exploratory contribution within a broader field of research on the governance architectures of local environmental services in the transition to a CE due to the limited availability of historical data, given that objectives in the waste management sector are particularly ambitious and cannot be achieved without significant evolution of the supply chain.

The remainder of this article is organised as follows: Section 2 outlines the study's theoretical background, Section 3 presents the methodology and research questions, Section 4 contains the framework, Section 5 includes the business case and Section 6 develops the discussion and policy implications.

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## 2. Background

Besides ownership, prominent levers for the public sector to stimulate the economy are industrial policy, which involves providing selective support for strategic sectors; antitrust, which protects against market power and excessive prices; environmental, social and governance regulation; and fiscal leverage. Although these forms of intervention do not replace public ownership, they replicate some of its effects and create new models of the public economy.

Public intervention traditionally encompasses correcting market failures, redistributing resources and providing public services. In today's economies, governments are evolving and acquiring new roles that contribute to economic sector governance (Kourula *et al.*, 2019). Governments have taken a proactive role in designing policies to address challenges posed by globalisation and digitalisation, and in supporting transitions to greener economies (Medaglia *et al.*, 2024). The purposes can be traced back to two guiding principles: equity and efficiency, which often involve trade-offs (Cepiku and Mastrodascio, 2021; Fernández-Gutiérrez and Van de Walle, 2018) and require careful policy design.

These objectives presuppose the existence of a legal system capable of ensuring compliance with the rules. The corrective function of market failures and service provision primarily respond to allocative efficiency criteria. However, equity is based on legal instruments, and the market typically achieves allocative efficiency. Justice and efficiency represent the guiding values of the state and the market, which shape one another in an evolving relationship (Hickerson, 1985; Riain, 2000). This raises the issue of compatibility between the state's original, justice-oriented role and its more recent, efficiency-oriented tasks.

The literature on the efficiency of public service provision presents diverse findings regarding the public vs private setting, due in part to the influence of many factors, such as context or sector (Liu, 2024; Lo Storto, 2016; Warner and Hefetz, 2002), as well as the interplay between government and market mechanisms. During the 20th century, public intervention increased until the 1980s, when a rethinking of government effectiveness emerged. To this end, arguments about the rise and decline of PEs can frame the trajectory of public ownership and its performance limits (Amatori *et al.*, 2013).

### 2.1 Rationality principles

State and market activities are based on different rationality principles. In the private sphere, the rationality principle is consistent with the principle of efficiency (Davies, 1971), and the voluntary dimension of exchange is essential because actors participate when they derive a benefit (Hammond, 2015). In the public sector, rational choices inherently involve social impact, and the means are laws that operate through mandatory provisions, ensuring the stability and universality of rights (Abdel-Nour, 1999; Halliday and Osinsky, 2006). This distinction generates a structural difference between the two spheres: market flexibility and rigidity of public action. Trade-off issues arise when the public seeks efficiency-oriented objectives, because a substantial difference exists between administrative issues and market dynamics (Bryson *et al.*, 2014; Eckerd and Heidelberg, 2019), given that PEs tend to balance social welfare, economic development and public interests (Bruton *et al.*, 2015; Merebashvili, 2024). The role of citizens in shaping service quality is also worth mentioning. In his seminal work, Hirschman (1978) analysed the well-known exit or voice game, which still plays a significant role in public service studies; the exit mechanism is typical of markets but becomes less relevant in public services, where the voice mechanism prevails (John, 2016). Although market-based public management reform has introduced customer choice among competing providers of public services, and voice can lead to quality improvements (Pierre and Røiseland, 2016; Simmons and Brennan, 2016), inelastic demand is the norm, and citizens cannot easily give up consumption or replace it with equivalent alternatives, due

to the monopolistic nature of public services. So, the voice, which could play a corrective role if well-organised (Akinboade *et al.*, 2014), is challenged by the convergence of widespread collective interests, which is due to the free rider trap (Olson, 1965). In this context, rationality remains central, as the growing configuration of public environmental services as common goods necessitates governance models that can balance economic efficiency with collective goals.

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## 2.2 Organisation and uncertainty

Analysing similarities and differences between public and private enterprises is relevant both in terms of the rationale for their existence and their economic justification (Boye *et al.*, 2022; Kearney *et al.*, 2009). These elements are central to understanding the conditions of coexistence, particularly in light of transaction costs (Rokkan and Haugland, 2021; Williamson, 2010). Market failure is associated with elevated transaction costs, information asymmetries and opportunistic behaviour. Boosted by Coase's 1937 seminal paper, scholars have discussed the conditions and circumstances under which firms emerge when coordination through the market becomes too costly due to the complexity of production, the numerous transactions required and the uncertainties associated with information and opportunistic behaviour. In this respect, an interesting perspective was the treatment of social cost as market failure (Jacobsen, 2014; Loasby, 2014). In such circumstances, firms facilitate the reduction of transactions and, to a certain extent, information and opportunistic problems; indeed, information is a scarce resource not easily available to enterprises and decision-makers (Chakravarti, 2017). In recent years, the debate on organisational theories has evolved to analyse contemporary challenges, such as governance, knowledge management, environmental issues and the impact of new technologies (Lember *et al.*, 2018), highlighting the need for companies' structures to adapt to constantly changing contexts (Lylova, 2018). Parametric uncertainty refers to scenarios in which all potential alternatives are known, whereas structural uncertainty refers to a lack of knowledge regarding the problem's configuration (Langlois, 2007; Rotmans *et al.*, 2001). Contractual instruments struggle to address structural uncertainty because they rest on a forward-looking delineation of future circumstances. Thus, integrating the uncertainty management framework to support public service contracting is important (Ahmet Erkoyuncu *et al.*, 2014; Love *et al.*, 2008). Structural uncertainty or non-standard events cannot be managed through contractual agreements and require a dynamic organisational structure. Structural uncertainty is directly associated with transaction costs, such as information and search costs, negotiation and decision costs and contract control and sanction costs (Dahlman, 1979). The author suggests that a lack of information leads to these costs.

## 2.3 Motivation and legitimisation

Firms are driven to perform in ways conducive to rational behaviour in a competitive environment, and this process penalises enterprises that engage in irrational behaviour. The concept can also be rooted in Habermas' forms of crisis in a capitalist system: economic, rational, legitimacy and motivation crises (Cordero, 2014; Plant, 1982). A private-sector crisis is typically economic, whereas the prevailing public-sector crisis concerns rationality. When individual motivations prevail over institutional ones, a motivational crisis arises that does not automatically lead to de-legitimisation, because the demand for public services is inelastic. Since the late 20th century, many countries have undergone liberalisation and privatisation processes driven by the common idea that markets can deliver services more efficiently. The guiding paradigm has inspired reforms in the energy, transportation, and telecommunications sectors, with the expectation that competition will replace public

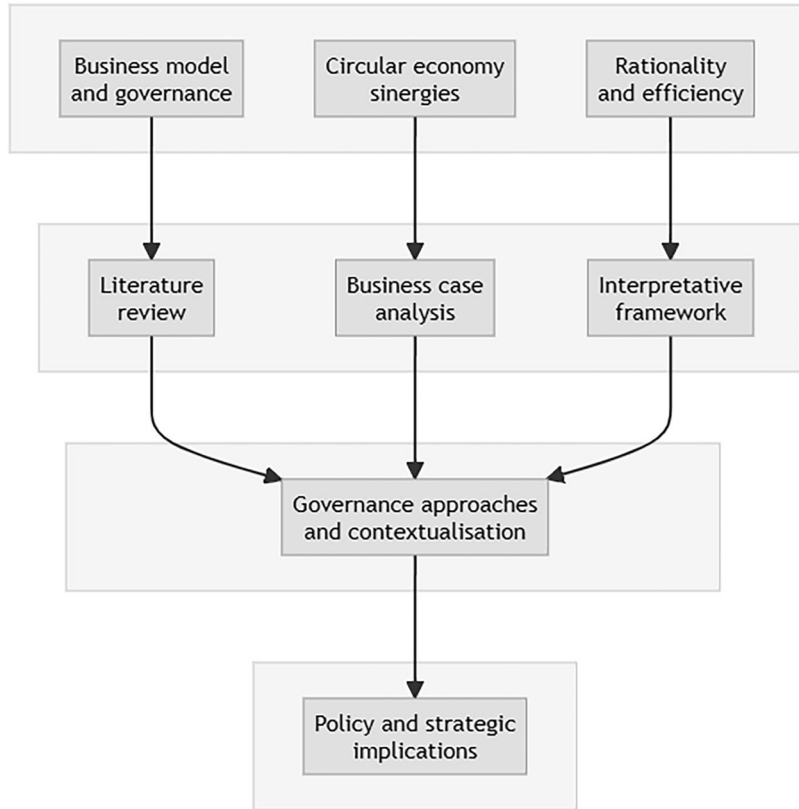
coordination as the primary driver of efficiency and innovation. However, empirical results in subsequent years demonstrated mixed outcomes (Dan and Andrews, 2015; Sachdev, 2002; Van de Walle, 2016). Contemporary economic conditions, geopolitical challenges and the pressing need to address environmental objectives have highlighted the limitations of certain market mechanisms that hinder the achievement of sustainability goals. The hypothesis that the liberalisation of public service sectors would engender superior benefits compared to those achievable through public management has proven weak when common goods are involved. Consequently, the division of roles between policy-making, regulation and management must be re-evaluated, which calls for exploring modern forms of ownership, governance and influence. There is a need to separate two levels of judgement: *ex ante* and long-term, determining whether the public sector should conduct a specific activity, and *ex post* and short-term, assessing whether the activity is performed efficiently, since public-private management is a valid approach for delivering certain public services (Warner and Hefetz, 2008). Environmental sustainability plays a central role, requiring efficient resource allocation, investment capacity and institutional flexibility. From this perspective, overly rigid administrative structures can hinder innovation and slow environmental transitions, while overly market-oriented models risk underinvesting. MSW and IWS management are relevant case studies for observing how inter-municipal aggregations can reconcile efficiency, public control and sustainability.

### 3. Methods

This study focuses on the synergies between MSW management and IWS management in market settings where industrial organisation is largely left to market forces and where spatially contiguous or adjacent municipalities forming a local cluster define the geographic scope. Three research questions were identified. *RQ1* investigates whether technical and operational synergies can support further progress towards CE goals in the analysed regulatory model. In the absence of supra-municipal governance structures, *RQ2* examines how efficiency-oriented industrial dynamics can coexist with public rationality principles. Lastly, with reference to similar regulatory settings, *RQ3* examines whether inter-municipal aggregation models can offer an effective organisational solution for combining industrial efficiency and public governance. The renewed interest in public intervention through enterprises as instruments for coordination, innovation and development (Patanakul and Pinto, 2014; Adanma and Ogunbiyi, 2024), together with the growing literature on hybrid governance arrangements (Wang *et al.*, 2017), provides the conceptual background for addressing these questions (Wang *et al.*, 2017).

#### 3.1 Research design

The research design is shown in Figure 1. We developed our ideas by adopting both a theoretical approach based on literature analysis and an analytical formalisation of a three-actor framework: service provider, municipality and society. In it, rationality is linked to production efficiency, governance and social welfare. The provider chooses the adequate quality level to maximise profits; the municipality sets the tariff limit and the contractual quality while facing monitoring frictions that worsen with the provider's size; and society minimises total disutility from tariffs and quality shortfalls. Indeed, as Alremeithi *et al.* (2025) report, perceptions of laws and regulations are an important driver of sustainable behaviour. In this paper, it is assumed that citizens maximise their utility by facing tariffs and service quality levels that are consistent with regulatory standards so that deviations, e.g. excessive tariffs or quality shortfalls, translate into higher perceived disutility. The discussion clarifies when this configuration is desirable. This approach allows us to integrate economic considerations with



**Figure 1.** Research design

**Note(s):** Figure 1 illustrates the research questions that inform the design of the research, enabling us to analyse governance frameworks and gain insights

**Source:** Authors' own elaboration

an institutional perspective, providing an interpretative framework for discussing implications and conditions under which similar models may be desirable for maximising social welfare.

The model represents a form of inter-municipal collaboration, driven by CE and aimed at safeguarding public governance in contexts where the organisation of local public services is largely delegated to the market. Since municipalities jointly own the utility, its innovative character lies in its ability to address municipal structural coordination failures that stem from informational and contractual asymmetries. The multi-utility assumes a coordinating role within this framework. This governance arrangement is consistent with the Italian regulatory framework, which encourages aggregation and integrated management processes to enhance efficiency.

### 3.2 Context and case selection criteria

In Italy, MSW governance is assigned to the regional level; however, institutional arrangements differ substantially across regions. Advanced levels of performance characterise the Lombardy context in achieving CE goals, which makes it increasingly difficult to make further improvements

through traditional operational levers. The latest data, as of 2024 (ISPRA – Istituto Superiore per la Protezione e la Ricerca Ambientale, 2025), show that in Lombardy, MSW disposed of in landfills accounted for approximately 1.87%, already outperforming the European target of 10% set by the CE Package. Similarly, the separate collection reached 74.32%, placing the region at high performance levels in national and European comparisons. Moreover, MSW management is characterised by the absence of supra-municipal governance structures, such as the so-called territorial optimal areas (ATOs), which are instead present in many other Italian regions. Consequently, municipalities remain the territorially competent authorities responsible for organising and regulating waste management services. This institutional configuration makes Lombardy a particularly relevant context for analysing governance and integration strategies driven at the municipal level, especially in a setting where CE goals have already been largely achieved and further improvements depend on advanced technological solutions, industrial synergies and organisational integration along the value chain. In such contexts, the selection of waste disposal facilities and the economic conditions of the service are determined through negotiation processes between municipalities and market operators, or through tenders, depending on the ownership and business model. Additionally, sectoral regulation encourages aggregation processes as a response to organisational fragmentation. The case study focuses on municipalities in the Lombardy region and serves as a framework for understanding governance dynamics that can also be observed in similar institutional contexts.

#### 4. Framework

Environmental services are increasingly recognised as public goods and of strategic interest. Thus, PEs are essential for guiding and supporting transformations. In this section, we revisit a typical case of public service provision and argue that, given the underlying tension, the equilibrium among competing interests is rarely sustained, a phenomenon we refer to as the public control paradox. Although a contract binds a service provider, the public sector often lacks the information or resources to exercise effective control. Consequently, regulatory power is likely to be weak, whereas a company that knows its costs and operating structure can obtain extra rents, even at the expense of service quality. In this study, we acknowledge that monitoring difficulty is correlated with provider size (including providers in which the municipality holds an equity stake). However, the evidence is mixed, and some studies report that monitoring capacity is determined more by service type and governance distance than by provider scale (Blom-Hansen *et al.*, 2020; D’Inverno *et al.*, 2022). Scholars point to several key factors. For example, service characteristics, which are often difficult to observe, pose challenges to monitoring regardless of provider size (Blomqvist and Winblad, 2020; Reymond *et al.*, 2020; Voorn *et al.*, 2017). Furthermore, technically or infrastructure-intensive services raise information asymmetries and require more specialised oversight capacity. Governance distance and legal form play an equally important role. As the distance between the municipality (principal) and the operator (agent) increases, transaction and monitoring costs increase due to information asymmetries and divergent objectives. This effect is particularly pronounced in smaller municipalities that lack contractual management capacity (Bel and Sebó, 2019; Voorn *et al.*, 2017). In contexts like the one examined in this paper, i.e. intermunicipal cooperation, dispersed ownership and multiple principals complicate coordination and supervision, increasing monitoring and governance costs even when scale brings some cost efficiencies. Thus, municipalities’ difficulty in monitoring services does not systematically increase simply because providers are larger (Arntsen *et al.*, 2021). Challenges arise, especially when services are complex or difficult to measure and when governance arrangements are complex. Similarly, we refer to service quality as the set of minimum and improvement standards relating to collection, sweeping, customer

relations and service continuity, as formalised in the service contract. Therefore, it represents a regulated, measurable and programmable dimension of service performance, consistent with the ongoing regulation (ARERA, 2022).

#### 4.1 Motivation

It is worth introducing how sectoral regulation promotes a shift towards an industrial model for managing MSW. The introduction of the economic and financial plan for the entire duration of the concession requires medium- to long-term planning. Tight integration of tariff regulation, service quality and tender design aligns revenues, investment commitments and performance targets. Additionally, standardisation introduced by the service contract and tender documents reduces contractual heterogeneity. The regulation also aims to emphasise technical and quality criteria signals rather than price competition, as in the past. Above all, territorially competent authorities are responsible for developing and implementing territorial strategies. Exploiting synergies with complementary services, such as IWS management, can generate positive externalities.

#### 4.2 Rationality choices

We consider the following three actors:

- (1) a service provider that aims to maximise profit;
- (2) a municipality whose objective is to maximise compliance with the contractual quality; and
- (3) citizens whose aim is to minimise costs, given that they cannot choose the service provider.

Thus, the voice and exit mechanisms are limited. The situation described above presents several problems, including information asymmetry, as the company is more familiar with its cost structure than its counterparts. A service provider's strategy is to choose the quality level  $Q$ , given the regulated tariff  $T$ . Equation (1) formalises profit  $\Pi$  maximisation with  $c(Q)$  being the service's cost as a function of effective quality  $Q$ :

$$\max_Q \Pi = T - c(Q) \quad (1)$$

A municipality sets a tariff  $T$  and specifies a minimum contractual quality level  $Q^*$ , so the quality level chosen by the service provider should be as close as possible to the contractual quality level, as indicated in equation (2), given its governance capacity, where  $\Pi_{min}$  represents the minimum profit that ensures the contract remains sustainable, and  $\phi(S)$  is the municipal governance:

$$\min_{T, Q^*} \frac{|Q - Q^*|}{\phi(S)} \text{ s.t } \Pi \geq \Pi_{min} \quad (2)$$

Society (users) cannot choose  $T$  or  $Q$  and wish to minimise the total perceived cost and disutility from insufficient quality as in equation (3) where  $U_C$  is the total perceived cost, and  $D(Q)$  is the disutility arising from a quality level  $Q$  below expectations:

$$\min U_C = T + D(Q) \quad (3)$$

An equilibrium is acceptable if it satisfies the following conditions simultaneously: economic sustainability, minimum quality standards and an acceptable cost to citizens. In the current model, the company's tariff  $T$  covers operating and investment costs. Achieving CE objectives requires substantial investment in treatment plants and new technologies, which can only be afforded by medium-sized and large companies. Larger companies can achieve economies of scale and usually oversee contracts across multiple municipalities, which often struggle to effectively monitor service standards. The cost function incorporates economies of scale as in [equation \(4\)](#) where  $f'(S) < 0$  and  $f''(S) > 0$ :

$$C(Q, S) = c(Q) \cdot f(S) \quad (4)$$

The service provider maximises profit as formalised in [equation \(5\)](#),  $f(S)$  is a decreasing function for economies of scale, but may increase beyond a threshold (organisational complexity). By contrast, economies of scope are embedded in the structure of  $c(Q)$ , which may decrease with operational synergies:

$$\max_{Q, S} \Pi = T - c(Q) \cdot f(S) \quad (5)$$

The municipality seeks to minimise the deviation from the contractual quality level, and its governance capacity decreases as service provider size increases, making deviations from the contractual quality level more likely as in [equation \(6\)](#):

$$\max_{T, Q^*} \frac{|Q - Q^*|}{g(S)} \text{ subject to } \Pi \geq \Pi_{\min} \quad (6)$$

Citizens cannot directly influence the outcome, but they are indirectly affected by the scale of the service provider. In this case, the tariff may decrease due to greater efficiency, while service quality may worsen due to weaker control mechanisms. Thus, the total perceived cost can be formalised in [equation \(7\)](#), where:  $D(Q, S) = d(Q) + \delta(S)$ :

$$\min U_C = T + D(Q, S) \quad (7)$$

Provided the benefits of scale in terms of cost efficiency, in that setting, social welfare may also contrast with scale due to a loss of local governance. [Table 1](#) resumes the situation.

**Table 1.** Public service stakeholders and roles

Actor	Controlled variables	Objective	Effect of scale	Effect of aggregation
Service provider	Effective quality	Maximise profit	Efficiency gains	Wider scope, unified investment potential
Municipality	Tariff and contractual quality	Effective governance	Potential weaker governance	Common strategy and stronger governance
Society	–	Fair cost and quality	Mixed	Mixed

**Note(s):** The table summarises the actual and potential implications of the model implementation of key actors

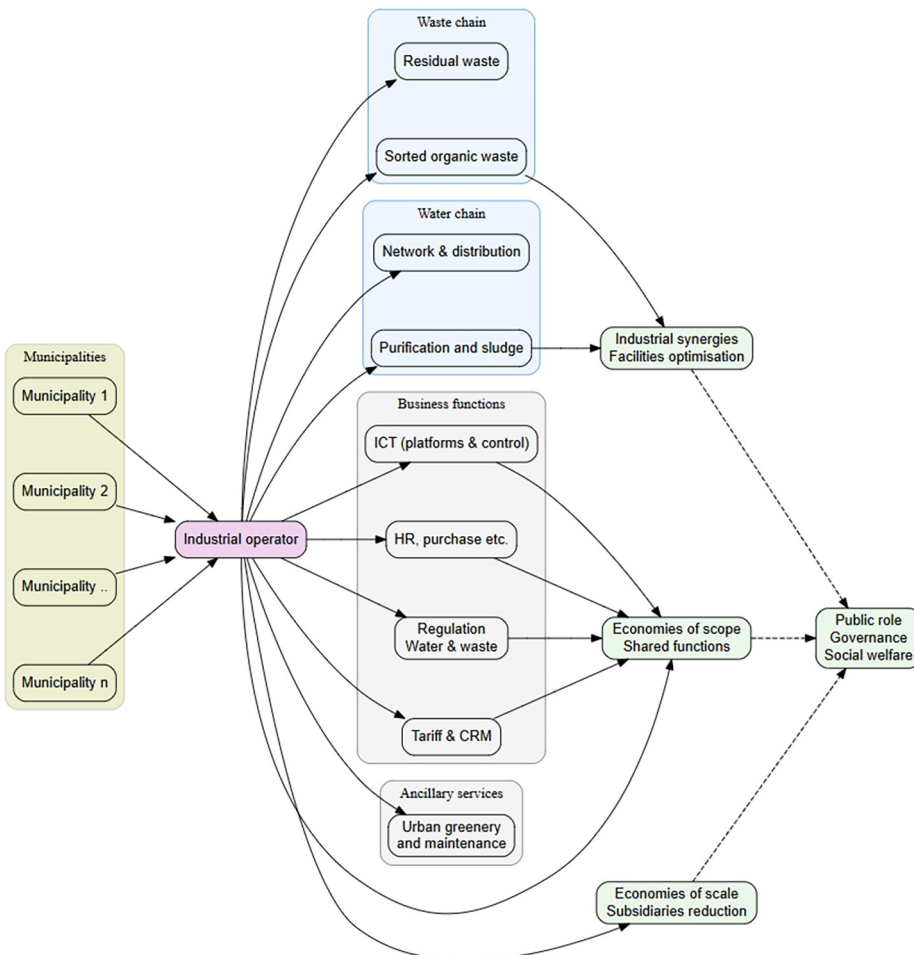
**Source(s):** Authors' elaboration

### 4.3 Limitations

This framework has several limitations. The purpose of the equations is to provide a conceptual representation of the interests and constraints embedded in SPCs. Their formulation is directly traceable to standard contractual arrangements and, in this paper, to the financial and economic structure of MSW management as typically reflected in the financial plans. Therefore, the main limitation of the study is that the parameters are used for interpretative purposes, and the application is limited to a set of services, namely, MSW and IWS. Further validation would be required to assess the framework's applicability to other areas of local public services. The model is also static and does not account for dynamic effects related to investment, learning or organisational adaptation over time. Simultaneously, the framework is designed to be transferable to institutional settings characterised by similar structures, regulatory arrangements and patterns of inter-municipal coordination, suggesting its potential relevance beyond the specific case examined, while acknowledging that context-specific features remain prominent. Indeed, while the proposed framework highlights the potential role of coordinated public intervention, it also entails trade-offs and failure conditions, including risks of institutional capture, coordination failures, unintended distributive effects and challenges related to accountability and governance, which may limit its effectiveness if not adequately addressed.

## 5. Business case

The MSW management sector is marked by fragmentation and substantial opportunities for integration with other environmental services. This study examines a scenario in which municipalities start a process to enhance overall efficiency and control capabilities. A utility that is already responsible for the in-house management of the IWS management is at the centre of this aggregation. It acts as a system operator that facilitates common functions, fosters synergies between supply chains and adopts an industrial approach to managing local public services. This setup illustrates the organisational and governance implications of the proposed framework in practical detail: on the one hand, the pursuit of economies of scale and scope; on the other hand, the need to maintain municipalities' governance. The following analysis explores these dynamics, highlighting synergies, expected benefits and the conditions for the service provision approach's effectiveness. The reference market has the typical structure of the waste sector, which is divided into two levels: upstream treatment plants and downstream collection and transport activities. Sector governance develops in a market without supramunicipal regulation that defines flows, tariffs and business models. In this scenario, municipalities face the dilemma of achieving a minimum efficient scale. The benefits include improved production efficiency, enhanced operational synergies and improved resource optimisation. However, it also poses significant risks, including the loss of control by smaller municipalities and reduced local bargaining power. Ultimately, society's interests remain the central issue. The implications for efficiency and effectiveness are twofold. Regarding efficiency, we refer to the synergies that may emerge if the utility adopts a multi-utility configuration with specific coordination functions (Di Foggia and Beccarello, 2022). In this setup, governance capacity is strengthened by integrating complementary services, with potential benefits derived from synergies. The regulatory capacity function shows how an increase in the size reduces the monitoring capacity, making deviations from the contractual quality standard more likely. The utility can compensate for this deficit by operating on behalf of municipalities. Optimising equation (7) reduces the total cost of the service, including the tariff and the disutility associated with quality and management scale. Figure 2 resumes the synergies.



**Figure 2.** Expected optimisation  
**Source:** Authors' own elaboration

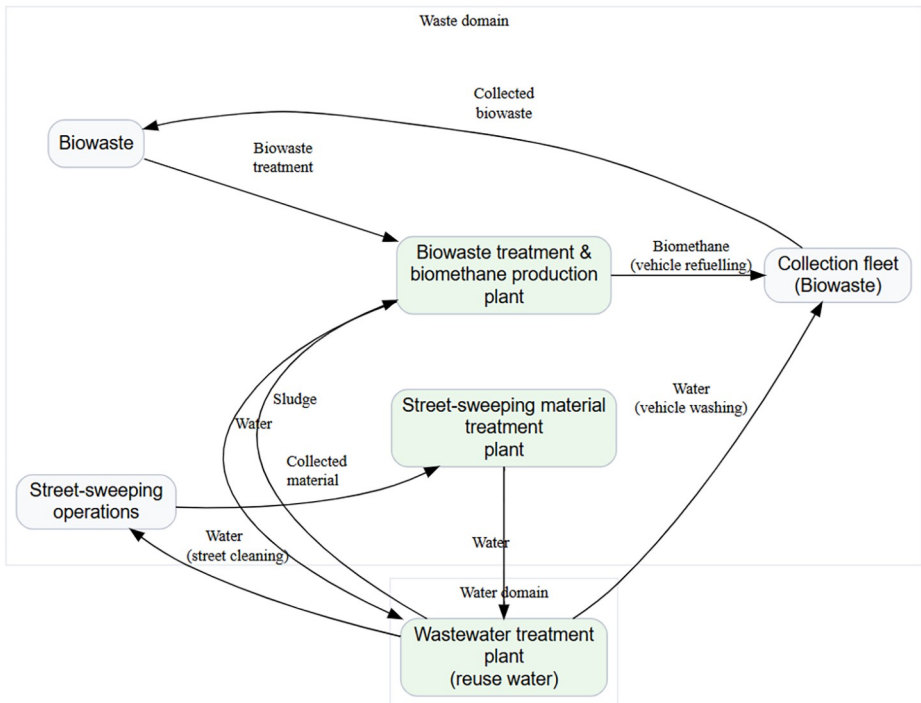
Table 2 compares the key dimensions of organisation, governance and management of local public services. The table presents the study's theoretical hypotheses and empirical insights in a comparative form, illustrating how the governance models may be associated with different patterns of efficiency, coordination and alignment with collective interests.

MSW and IWS management face prominent governance challenges (Aguilar *et al.*, 2022; Thomashausen *et al.*, 2018), and a convergence towards industrial models based on efficiency and economic sustainability is expected to encourage the overcoming of local fragmentation. The synergies between IWS and MSW infrastructure and processes are significant, as shown in Figure 3. The model is designed as a conceptual framework consistent with the analysis's case study nature. The underlying economic logic is implicitly illustrated through the graphical representation of synergies between IWS and waste management, which can be interpreted in

**Table 2.** Fragmented and integrated service organisation

Area	Municipal level	Inter-municipal area
Industrial plan	Planning was developed at the municipal level	Planning organised at a multi-service level
Efficiency and associated costs	The administrative and operational functions are managed separately across entities	The administrative and operational functions are managed in an integrated manner
Investment capacity	Local-based investments	Decisions refer to a larger scale
Monitoring the service quality	Set at the municipal level	Defined within a common governance framework
Governance and control	Direct municipal control	Control through shared governance mechanisms
Public subsidiaries	The presence of multiple local subsidiaries	Reduce the number of subsidiaries
Infrastructure and facilities	Infrastructure managed on a single-service basis	Managed infrastructure with coordination across services

**Source(s):** Authors' own elaboration



**Figure 3.** Technical synergies from the integration of waste and water chains

**Source:** Authors' own elaboration

light of the double marginalisation theory. Integration mitigates sequential markups associated with vertically or institutionally separate services. In this sense, the model serves an analytical function in interpreting the observed coordination gains. Integration, also referred to as synergy in our case, leads to a single markup at lower final prices than two independent monopolists (Bajo-Buenestado and Borrella-Mas, 2022; Kwoka and Slade, 2019). Indeed, in the municipal waste sector, characterised by information asymmetries in procurement, double marginalisation is common, and vertical integration can help align costs and quantities within the integrated firm (Choné *et al.*, 2023; Loertscher and Marx, 2022).

Plants that treat MSW, sludge and organic waste can be coordinated to promote industrial planning for the water-waste cycle. These synergies help to optimise the use of treatment plants in line with sustainable development objectives.

## 6. Discussion and implications

This study contributes to the literature on local public service governance, specifically on the trade-off between operational efficiency and public control, by integrating efficiency dynamics, governance structures and service complementarities. Our assumptions are consistent with the literature, as the operational and technological synergies associated with integration allow economies of scale and scope to be exploited. Conversely, the assumption of public control can be maintained through coordinated governance structures, such as territorial control committees and shareholders' agreements, which help reduce information asymmetries. Inter-municipal cooperation has significant potential as a countervailing force against dominant suppliers and as a lever for broader policy objectives and community benefits (Wontner *et al.*, 2020), provided there is a common strategic rationale (Lerusse and Van de Walle, 2021). However, fragmentation, political capture or information asymmetry, among other factors, often mitigate its effectiveness (Mussari *et al.*, 2025; Walker *et al.*, 2013). Therefore, well-defined shareholder agreements are essential to preserve municipalities' power as a real countervailing force in practice.

The results share some similarities with previous studies. Some studies indicate that many municipalities operate at suboptimal scales, suggesting that inter-municipal cooperation or joint organisation is particularly relevant for small municipalities (Caldas *et al.*, 2019; Llanquileo-Melgarejo and Molinos-Senante, 2021). However, the optimal size of the service is not unlimited: more recent evidence indicates decreasing or U-shaped economies of scale, with cost increases beyond certain population or service size thresholds (Söderberg *et al.*, 2025). Cooperation also tends to generate cost reductions, suggesting economies of scope (Sarra *et al.*, 2017), consistent with evidence of cost complementarity between disposal and recycling in multi-output studies (Callan and Thomas, 2001). Overall, the results indicate that economies of scale and scope are real but context-dependent (Bartolacci *et al.*, 2019; Beccarello and Di Foggia, 2023).

Although the interpretation of our results should be limited to expected efficiency rather than observed performance, we argue that an increase in firm size is associated with economies of scale and scope, with a governance trade-off that does not imply a loss of public control *per se*, as shared governance arrangements can partially reconstitute control through coordinated oversight mechanisms. Thus, the analysed model can simultaneously support operational and technological synergies, providing a context in which shared governance mechanisms can be implemented when focusing on a utility with system operator functions. The case study's main innovation is to show how industrial synergies between MSW and IWS can support CE goals. This approach is relevant in contexts where environmental performance is already in line with European objectives, as further progress towards the CE requires industrial advances capable of generating substantial improvements without increasing the overall costs of the service, as in the case of VI and plant synergies analysed.

With respect to regulatory compliance, the proposed model may offer an advantage by facilitating the management of regulatory complexity and compliance, as well as investment commitments and performance targets, which incentivise economies of scale and scope. The synergies described in this article align with the emphasis on technical and quality criteria that modern regulatory preferences place on service performance. Lastly, the role assigned to territorially competent authorities (municipalities in our case) in defining coherent territorial strategies implicitly favours supra-municipal scale arrangements and consolidated governance structures.

We acknowledge that this approach is not a universal solution but rather a viable one in cases where it is consistent with the objectives of coordination and managerial rationalisation, and in light of an industry in which settings other than competitive tendering are options for increasing market potential (Massarutto, 2007). The sequential application of markups along the value chain may generate allocative inefficiencies when a supply chain is divided into multiple stages. Vertical integration can mitigate these effects by coordinating decisions across the different stages of service provision, whereas horizontal integration among municipalities can reduce organisational duplication and transaction costs.

Implications for municipal policy and planning also emerge. The analysed configuration enables rationalising subsidiaries. This configuration can effectively link industrial efficiency and public governance when properly implemented, thereby contributing to achieving CE goals. This work aims to explore the institutional and organisational conditions under which inter-municipal coordination models may be relevant. The justification lies in the fact that the CE goals in the waste management sector are particularly ambitious and cannot be achieved without significant evolution of the supply chain. Exceeding current performance requires further efficiency gains that exceed the direct capacity of traditional policy instruments. We argue that the integration of the urban waste supply chain, including synergies with related local environmental management activities, has significant room for optimisation.

## 7. Conclusion

Starting from an analysis of the trade-offs between efficiency and public governance, this study has examined a CE-oriented framework for the provision of local environmental services. The contribution of the paper lies in moving beyond conventional classifications of local service delivery by highlighting how organisational integration may generate synergies in MSW and IWS management while preserving public governance. The analysis emphasises the need for governance arrangements capable of enhancing the efficiency of services characterised as common goods. Within this perspective, the framework suggests that efficiency and public governance can be reconciled when regulatory design facilitates integrated organisational configurations. Such insights are consistent with recent regulatory requirements that emphasise organisational capacity to manage complexity, investment commitments and performance targets, thereby encouraging economies of scale and scope and supporting supra-municipal governance structures. However, the framework is intended to be context-specific and may be relevant to similar institutional settings. Future research should focus on empirical analyses of industrial organisation to assess the conditions, limitations and implications of such configurations, including the evolving role of public utilities.

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