ACTION PLAN FOR GENERAL GOVERNMENT SPENDING REVIEW

(Spending Review Phase III)

Public sector financial instruments to support the productive sectors of the Spanish economy and urban waste management

CONTENTS

1 GENERAL INTRODUCTION

On June 29th, 2021, the Council of Ministers adopted a resolution commissioning Phase III of the General Government Spending Review to AIReF. As a continuation of Phases I and II of the Spending Review, the Central Government requested AIReF to evaluate the financial instruments made available by the public sector to support the productive sectors. It is also required to evaluate public spending allocated to urban waste management. In particular, AIReF will evaluate:

1. **Public spending on financial instruments to support the productive sectors of the Spanish economy, in particular, those relating to internationalisation.**

2. **Public spending on urban waste management and economic and fiscal instruments for internalisation of market failures[1].**

Financial instruments[2] are tools frequently used by the public sector to facilitate access to finance by companies, by means of the granting of loans or credit lines, with holdings in their capital or quasi-capital instruments via insurance, guarantees and sureties. These different instruments pursue economic policy goals of a structural nature, such as internationalisation, R&D&I, digitalisation, green investments and the growth of small companies, along with specific support for certain sectors, such as industry and tourism, or counter-cyclical actions that counteract the effects of economic crises. Some form of market failure operates in each of these actions that justifies public intervention (Bator, 1958; *Mankiw et al.*, 2002; Weimer & Vining, 2004).

AIReF has already evaluated some of the public sector aid to support productive sectors. In particular, an evaluation was made in 2018 of the Programme of Loans to new Industrial Projects to support Productive Investment (RCI) of the Ministry of Industry, Trade and Tourism from which the reformulation proposals were derived to improve their impact which were already set up through the constitution of the Support Fund for Productive Industrial Investment. In relation to other types of support, it also addressed the strategic evaluation of subsidies, for which major deficiencies in the development and usefulness of the strategic plans were highlighted, the scant use of coordination mechanisms, the existence of an outdated regulatory framework, along with deficiencies in the procedures and their monitoring. Lastly, in 2019, the evaluation of the tax benefits for R&D&I in corporate income tax discovered that for each euro

[1] The evaluation of financial instruments will seek to determine their global volume and analyse the efficacy of those designed for the internationalisation of companies, estimated at some €7bn annually. An initial estimation places the cost of municipal waste management at some €4.25bn.

[2] In this study, a financial instrument is considered to be a contract that gives rise to a financial asset in an agent, and simultaneously to a financial liability of an equity instrument in another agent involved. Hence, the specific analysis of non-refundable aid is not included, such as subsidies, which were already analysed in Phase I of the Spending Review.

of support, the public sector mobilised 1.50 euros in the private sector. Furthermore, the AEVAL had already evaluated some of these instruments between 2007 and 2010.

The aim of this evaluation is to contribute to strengthening financial instruments to support productive sectors by means of a strategic analysis of the set of instruments and an in-depth study of the efficacy of those aimed at supporting the internationalisation of companies, along with the procedures that may condition their results. In particular, the Pillar 1 will study the organisation and planning of the instruments of both Central Government and the Regional Governments, their relevance and coherence in attenuating market failures that are sought to be internalised, along with their monetary flows, which will be characterised with the agents involved and the nature of the activities and sectors that receive support. Pillar 2, focusing on the efficacy and efficiency of the instruments to foster internationalisation, will study, by using counterfactual methodologies and elasticity, to what extent they contribute to increasing the export probabilities of companies, the extent to which investments abroad are mobilised and whether they contribute to job creation (Badinger & Url, 2013; Felbermayr *et al.* 2012; Heiland & Yalcin, 2015; Agarwal *et al.*, 2018). Furthermore, this evaluation will include a study of the application procedures and concession criteria to the extent that they can determine the efficacy of the instruments, both individually and as a whole.

The second evaluation of this Phase III of the Spending Review will focus on urban waste management, which constitutes one of the classic examples of negative externality, with consequences on the environment and health that requires the intervention of the public sector. This intervention must pursue the design of a waste management strategy that, through the use of standards and incentives, guarantees an optimum volume of waste at both an aggregate level and at each level of the waste hierarchy (prevention, re-use, recycling, recovery and disposal), which comply with the targets set by the European Commission.

The evaluation by AIReF of waste management will seek to provide the General Government (central, regional and local) with a set of proposals on the most effective and efficient instruments to overcome the challenges Spain faces on recycling and disposal and thus meet the targets set by EU and national legislation. To that end, the evaluation will be structured around three pillars, which will address: firstly, a revision of best international practices to meet the targets set on waste; secondly, the analysis of the situation of infrastructure, management and economic and fiscal instruments at a State and regional level, and in a representative sample of municipalities; and lastly, a study, by means of the analysis of practical cases and the use of counterfactual techniques, of those economic and fiscal instruments and incentives that have proven to be the most effective in increasing the percentages of recycling and in reducing the use of disposal, thus guaranteeing the sustainability and sufficiency of financing

systems (De Jaeger & Eyckmans, 2015; Carattini *et al.*, 2018; Compagnoni, 2020; Dhanorkar & Muthulingam 2020). This will lead to the drawing up of realistic proposals to achieve recycling figures closer to European targets, albeit particularly taking into account the different starting points, characteristics and realities of each tier of government involved in the process.

The Action Plan will now describe, for each of the two evaluations, the context, aims and scope, the methodologies, databases, governance and timeline. Furthermore, in accordance with the provisions of Article 23 of the Organic Charter of AIReF and prior to preparing the study, a budget is set in line with the public prices established by the Resolution of the President of AIReF, dated December 18th, 2019 (OSG of December 23rd, 2019).

2 DESCRIPTION OF THE PROJECTS

2.1 Evaluation project 1: Public sector financial instruments to support productive sectors

2.1.1 Context

Context of the evaluation

The public sector intervenes in market economies to try and correct inefficiencies caused by market failures that limit their growth and reduce wellbeing. These failures arise in those situations in which the allocation of resources by the market is not effective, which tends to be due to the nature and conditions of the markets (level of monopoly), the characteristics of goods (non-exclusivity and/or externality) or the context of the exchange in which they take place (transaction costs, principal-agent problems and asymmetrical information)[3]. The public sector has different instruments available to attenuate these market failures: regulatory, support and taxes, which have been widely studied at a micro-economy level (Mankiw *et al.*, 2002; Weimer & Vining, 2004).

The financial instruments made available by the public sector to support the productive sectors seek to facilitate access by companies to financing to incentivise them to engage in activities with significant repercussions on economic growth and productivity. A host of studies have addressed the causes of restrictions on obtaining finance faced by companies, particularly smaller ones, identifying information failures, the company's lack of reputation and limitations on the evaluation of the risks of their projects. These causes justify public intervention that allows access to the resources needed to viable companies, encouraging private credit to focus, by means of its instruments, on advanced business activities and expanding markets (Myro & López, 2016).

The internationalisation, innovation and digitalisation of companies are activities with recognised benefits on productivity and business growth that receive horizontal support from the public sector[4]. These activities, which benefit each other, generate increases in productivity by means of opening up new markets and distribution channels, the exposure to and generation of new work methods, the creation of knowledge, improvements in product quality and job positions, and the development of new infrastructure, among others. However, they face such market failures as high

[3] See Stiglitz (1989, 1998) for a review of the types of market failure.
[4] See Sánchez-Fernández *et al*. (2014) for an analysis of the repercussions of internationalisation on the evolution of Spanish companies, and Griffith *et al*. (2006) on innovation and productivity.

entry costs stemming from the need to make significant investments in physical, human and technological capital, and the existence of asymmetrical information on new products and markets, which involves taking significant risks that many companies cannot afford. In addition, these activities generate benefits and spillovers (new markets, creation of knowledge, development of technologies and infrastructure, etc.), which not only affect those companies that implement them but also extend throughout the economy (non-exclusivity) and that justify public support for these activities.

The development of sectors considered strategic has also traditionally been vertically backed by public intervention. This is particularly true in the development of economies, but also at times of structural change and economic crisis, when the public sector devises support of a sectoral nature based on the existence of positive externalities with a knock-on effect on the economy, such as those derived from interdependency in production (Myro & López, 2016).

At present, support from financial instruments should primarily focus on measures of a horizontal nature that must adapt to those sectors considered to be strategic. International consensus on trade and competition have steered the focus of financial instruments towards horizontal measures that seek to correct market failures and that are then adapted to the sectors with the ability to provide the greatest benefits.

The commission of the Council of Ministers will enable this evaluation to contribute to redirecting these instruments towards those that are most effective and efficient, strengthening their usefulness in the transformation strategy of the Spanish economy that guides the Recovery, Transformation and Resilience Plan (RTRP). This Plan underlines the importance of internationalisation, innovation and digitalisation as driving policies in supporting SMEs (Component 13), industrial policy (Component 12) and tourism (Component 14). These activities and sectors will be supported, among other measures, by existing financial instruments and by the development of other new instruments.

Context of financial instruments to support productive sectors in Spain

The financial instruments that support the productive sectors in Spain are provided by a range of entities and tend to be specialised in their scope of action and by the nature of the instrument. Coordination on internationalisation falls under the jurisdiction of the Ministry of Industry, Trade and Tourism, which is also responsible for industrial policy and tourism; innovation falls on the Ministry of Science and Innovation, while digitalisation falls on the Ministry of Economic Affairs and Digital Transformation. All of these, together with other ministerial departments that drive these activities within their sphere of influence, and with regional and local governments, participate in the policies and strategies that define the actions of the instruments under study here. They

do so through their own departments and also by means of associated public entities and enterprises. Instruments take the form of loan programmes, credit lines, holdings in capital or quasi-capital, insurance, guarantees and sureties, among others, sometimes channelled through funds without a legal personality.

In the field of innovation, the main agents financing business projects are the Centre for the Development of Industrial Technology (CDTI) and the National Innovation Enterprise (ENISA). The CDTI, attached to the Ministry of Science and Innovation, primarily provides support in the form of partially repayable loans and subsidies and also has venture capital instruments through its collective investment company INNVIERTE. According to its annual report, the CDTI committed €834m in 2019. For its part, ENISA, which is attached to the Ministry of Industry, Trade and Tourism, provides financial support to innovative entrepreneurship projects of SMEs by means of equity loans, with an investment of €92m in 2019.

Financial support for digitalisation is centralised in the State Secretariat for Digitalisation and Artificial Intelligence (SEDIA), attached to the Ministry of Economic Affairs and Digital Transformation. Since the end of the Strategic Action in the Economy and Digital Society programme (last round of aid in 2017), which combined subsidies with loans aimed at boosting the incorporation of ICT in SMEs and at strengthening the ICT sector, financial support for digitalisation has been structured through subsidies for the extension of next generation broadband, to drive enabling digital technologies, and, more recently, artificial intelligence. The 2025 Digital Agenda, approved in July 2020, provides, among its measures, for the modernisation of the financial architecture for public support on this matter, which was recently firmed up in the creation of the Next Tech Fund, a fund of venture capital funds aimed at driving the growth of digital companies and investment in high impact technology projects. The fund will be allocated a provision of €2bn, with resources from SEDIA and ICO-AXIS.

Multiple agents are involved in financing to support the internationalisation of companies, generally those specialised in the nature of the instruments employed. The State Secretariat for Commerce, attached to the Ministry of Industry, Trade and Tourism, offers financing through different instruments: loans from FIEM[5]; capital and quasi-capital instruments from COFIDES[6], through own resources, however, above all, as the manager of FIEX and FONPYME[7] public funds; State export credit insurance from CESCE[8] and interest coverage from CARI[9]. Furthermore, through the Ministry of

[5] Fund for the Internationalisation of Companies, managed by the State Secretariat for Trade.
[6] Spanish Export Credit Insurance Company.
[7] Fund for Investments Abroad (FIEX) and Fund for Investments Abroad by Small- and Medium-Sized Enterprises (FONPYME).
[8] Spanish Export Credit Insurance Company.
[9] Reciprocal Interest Adjustment Contract.

Economic Affairs and Digital Transformation[10], the ICO, which, in turn, is the financial agent of FIEM and CARI, provides direct financing through credit lines with financial institutions, along with capital instruments channelled through its investee, AXIS. The ICEX acts as a single access window for companies and provides advice and support for internationalisation projects. In total, with the data available for last year for each instrument, some €7bn are mobilised each year[11], with the leading roles played by CESCE and ICO.

Lastly, the General Secretariat for Industry and Small- and Medium-Sized Enterprises and the State Secretariat for Tourism design loan programmes for sectoral impetus and to foster innovation and digitalisation from this perspective. FERGEI[12] was set up at the start of 2020, with an allocation of €200m, with a view to providing coverage for electro-intensive consumers against risks stemming from medium- and long-term electricity purchase agreements. In 2021, FAIIP[13] was set up, with an allocation of 600 million euros, with a view to strengthening the competitiveness of industrial companies, stimulating initiatives that incorporate advanced technologies, generating qualified jobs and contributing to increase the export base. CERSA[14] provides support to SMEs and the self-employed to provide them with access to financing, with a secured amount of €663m in 2019. In addition, loans exist to promote R&D&I in the manufacturing industry (€80m), the Connected Industry 4.0 programme (€55m) and other forms of support through subsidies. In the field of tourism, following the end of the lines of support for internationalisation, R&D&I and the entrepreneurship programme Emprendetur (last round of aid in 2016), the State implemented the Financial Fund for Tourism Competitiveness (FOCIT) to channel aid to this end through loans, although no operations have been recorded since its creation and its reform has been planned through the RTRP, by means of the approval of its implementing regulation, which will guide it towards actions to improve energy efficiency and the circular economy.

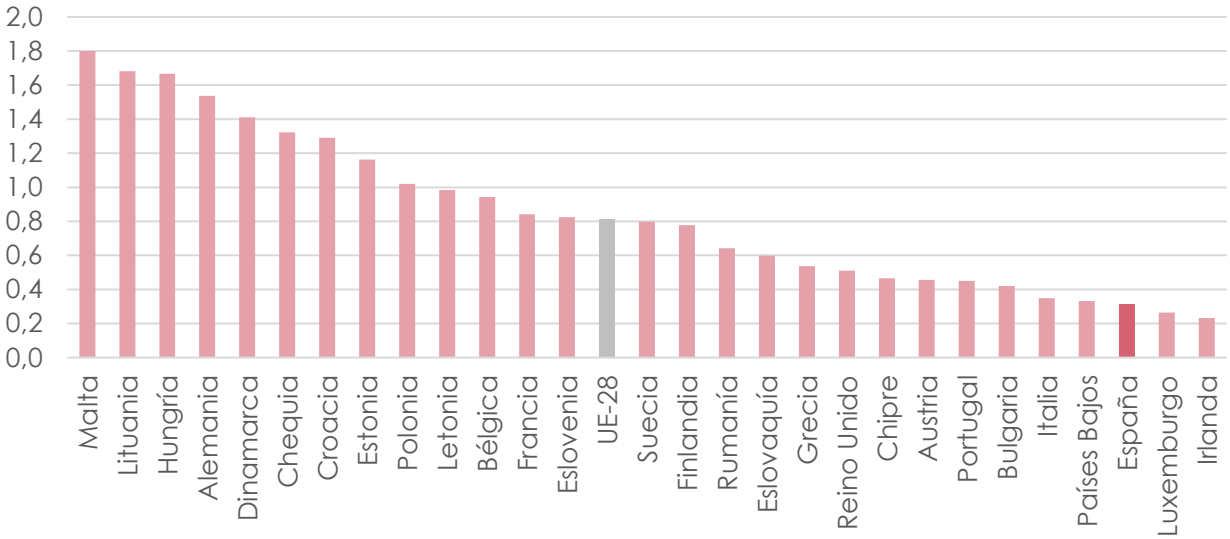
In addition to these instruments, measures exist to combat the effects of the pandemic, which are of a cross-cutting scope in the main and seek to guarantee the survival of companies. In March 2020, a credit line of €100bn was set up in the form of guarantees through ICO to guarantee the liquidity of companies and prevent solvency problems. In July 2020, €40bn were added to support the financing of new investments, also through ICO guarantees, and the Fund to Support the Solvency of Strategic Companies was set up, with an allocation of €10bn, managed by SEPI[15] in the form of

[10] The Ministry of Economic Affairs and Digital Transformation also manages different debt conversion programmes which, while they represent an opportunity for the internationalisation of Spanish companies, are not designed to promote internationalisation and thus fall outside the scope of this evaluation.
[11] See the breakdown in 0.
[12] Spanish Reserve Fund for Electro-intensive Entity Guarantees, attached to the Ministry of Industry, Trade and Tourism and managed by CESCE.
[13] Fund to Support Productive Industrial Investment, set up by the General State Budget Law 11/2020, of December 30th, attached to the Ministry of Industry, Trade and Tourism and managed by SEPI.
[14] Compañía Española de Reafianzamiento (mutual guarantee scheme).
[15] Spanish Industrial Holding Company.

capital and quasi-capital instruments and credit facilities. Similarly, in March 2021, the Recapitalisation Fund for companies affected by COVID-19 was set up, designed to support the solvency of medium-sized enterprises with €1bn, managed by COFIDES. The Line of Direct Support, granted by the Autonomous Regions through ICO, was set up, in addition to these instruments, on the same date, with a fund of €7bn, along with the Line for the Restructuring of Financial Debt, to make loans with public guarantees more flexible, with an allocation of €3bn, through ICO. Lastly, support for the tourist sector was channelled through the Thomas Cook loan programme, with a provision of €400m[16].

Taking as a reference the State Aid Scoreboard of the European Commission, which reflects the raft of support for industry and services, Spain had made less effort than most EU countries to support industry and services prior to the pandemic. The figures shown in 0 also include support in the form of subsidies, tax benefits and reductions and discounts in social contributions. Furthermore, the volume only takes into account the element of support provided through each of the instruments. The differences with the EU average widened hugely with the 2008 economic-financial crisis and, despite recovering since 2015, this gap has still not been reduced (0).

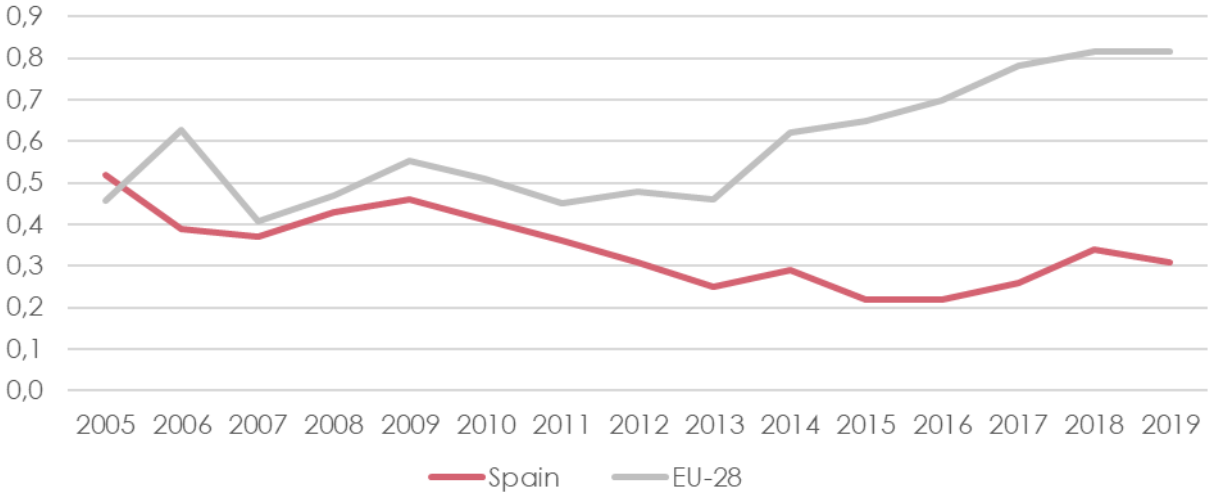
GRAPH 1. REGULAR SUPPORT FOR INDUSTRY AND SERVICES IN THE EU (% OF GDP), 2019[17]



Source: AIReF based on State Aid Scoreboard 2020, European Commission.

[16] The Thomas Cook Line was approved in January 2020 to support tourism companies affected by the bankruptcy of the Thomas Cook group, with an initial allocation of €200m, which was subsequently increased to cater for needs stemming from the pandemic.
[17] Does not include agriculture, fisheries, the railway sector or the financial sector.

GRAPH 2. EVOLUTION OF REGULAR SUPPORT FOR INDUSTRY AND SERVICES IN THE EU (% OF GDP)[18]



Source: AIReF based on State Aid Scoreboard 2020, European Commission.

This evaluation will analyse the relevance and coherence of existing financial instruments to support the productive sectors, will strive to determine the overall volume of support and will analyse their efficacy and efficiency in one of the areas of a horizontal nature: internationalisation. Other areas may be progressively analysed in subsequent public spending review exercises.

2.1.2 Purpose and scope

The purpose of this evaluation is to contribute to strengthen the efficacy and efficiency of public instruments to support the productive sectors, by means of an initial analysis of the strategy of the set of instruments and an in-depth study of the efficacy of those aimed at supporting the internationalisation of companies, along with the procedures that may condition their results. The evaluation will be structured in two pillars of analysis, the results of which will contribute to provide information to public managers to guide their support actions in a more coordinated fashion, allocate funds to those instruments that are proven to be more effective and identify synergies, improvements and more effective alternatives to achieve the goals set.

Pillar 1 will address a global strategic evaluation of the set of instruments and analyse their relevance and internal and external coherence, as well as provide an approximation of their volume. Taking into account the instruments of the Central Government and Autonomous Regions, an analysis will be made of whether strategic

[18] Ibid.

planning to support the Spanish productive sectors exists, based on a correct and up-to-date diagnosis of the problems addressed. The relevance of the goals established and the suitability of the monitoring tools and mechanisms developed to achieve them will be studied. The internal and external coherence of the instruments with each other and with other complementary policies will also be determined. Lastly, a 'money map' will be drawn up of the financing granted through these instruments in a reference year, which will determine the money flows in regard to the agents involved, the instruments used and the activities, sectors and nature of the beneficiaries.

Pillar 2 will focus on the efficacy and efficiency of the instruments to promote the internationalisation of Spanish companies. Given the broad scope of these instruments and the deadline established to deliver this study, it is necessary to select a scope in which to focus the analysis on efficacy and efficiency, without prejudice to whether others are progressively addressed in subsequent exercises. In this study, AIReF proposes to analyse the instruments designed to promote internationalisation in several areas: the state of maturity of its strategy (2017- 2027) compared with others in different areas[19], since this incorporates a framework for evaluation that was shored up in the recent publication of the Two-Year Evaluation Action Plan 2017-2018[20] which will be completed with this efficacy analysis, and the identification, at this starting point, of a large number of different instruments, on the one hand, and of highly specialised multiple agents, on the other, with the coordination challenges that these entail.

In particular, Pillar 2 will analyse the efficacy and efficiency of the internationalisation instruments contained in 0, along with the extent to which they are conditioned by their procedures. It will analyse whether the instruments contribute to increasing the probability of exporting, the extent to which they mobile investments abroad and whether they contribute to job creation. This review will be preceded by a study of the beneficiaries of the instruments – each of them individually and overall – with a view to analysing, in practice, the coordination of the instruments and their capacity to drive each other. Furthermore, this evaluation will study the application procedures and criteria for granting them to the extent that this can determine the efficacy of the instruments.

[19] Internationalisation of the Spanish Economy Strategy 2017 – 2027, Spanish Science, Technology and Innovation Strategy 2021-2027, Digital Spain Strategy 2025 (approved in 2020), Industrial Spain Policy 2030 (approved in 2019), Modernisation and Competitiveness of the Tourism Sector Plan (contained in the RTRP, approved in 2021).
[20] https://comercio.gob.es/es-es/estrategia_internacionalizacion/Paginas/informe-evaluacion-plan-2017_18.aspx.

BOX 1. FINANCIAL INSTRUMENTS TO SUPPORT INTERNATIONALISATION, SUBJECT TO EVALUATION

Fund/Entity	Annual execution (€m)*	Managing agent	Ministerial department attached to	Instruments
ICO	2,590	ICO	MINECO	Loans, guarantees, capital, quasi-capital
FIEM	405	SEC	MINCOTUR	Loans
FIEX	232	COFIDES	MINCOTUR	Quasi-capital
FONPYME	27	COFIDES	MINCOTUR	Quasi-capital
COFIDES	37	COFIDES	MINCOTUR	Loans, quasi-capital
CARI	346	SEC	MINCOTUR	Interest coverage
CESCE	**3,519	CESCE	MINCOTUR	Credit risk cover

* Latest year available.
** Only includes the risk to the State.

Source: AIReF based on annual reports of the instruments.

The result of the evaluation will be contained in a document to be organised in three blocks: the first block will describe the purpose of the evaluation, the proposed analysis and the methodologies and databases used; the second will include the evidence found as a result of the evaluation for each of the pillars of analysis, and the third will include proposed improvements based on the conclusions reached in each of the pillars and instruments analysed.

2.1.3 Methodology

The analysis of the strategy of the financial instruments to support the productive sectors – Pillar 1 of the evaluation – will primarily require the use of qualitative methodologies. In particular, in relation to the financial instruments of the Central Government and the Autonomous Regions to support the productive sectors:

- A **legislative and documentary review** will be carried out on the scopes of action of existing instruments, classifying them according to the body they fall under, the aims they pursue, their nature, the companies they are aimed at, etc. with a view to determining their global scope, their coverage of the problems they seek to resolve, and identifying potential overlaps and synergies between them.

- A **review** of the theoretical and empirical **literature** on public support for the productive fabric of the countries will be performed, the barriers identified, the strategies followed and the results obtained.

- A **money map** of the amounts mobilised annually by these instruments will be created, identifying the origin and destination of the monetary flows and the characteristics of their beneficiaries.

- A **benchmarking or identification of good practices** exercise will be carried out at a national and international level, which will be used to draw up the proposals based on the most successful experiences.

- **Interviews and joint meetings** will be held **with managers and experts** in financial instruments and in the areas in which they act.

In order to see the efficacy and efficiency of the financial instruments to support the internationalisation of companies, Pillar 2 of the evaluation will employ quantitative methods to evaluate the impact of a counterfactual nature that have been widely used in scientific literature. Counterfactual methods have the virtue of employing identification strategies that allow the effects of the policies to be isolated from other determinants that can explain the evolution and conduct of the agents (Blundell & Costas Dias, 2000; Angrist & Pischke, 2009; Abadie & Cattaneo, 2018).

Although the academic literature has focused on analysing the effects of public support for internationalisation from an aggregate perspective (country or sector level), the number of microeconomic studies at a company level has soared in recent years. The work by Abraham & Dewit (2000), Moser *et al.* (2008), Felbermayr *et al.* (2015), Van der Veer (2015) and Agarwal & Wang (2018) find a positive relationship between public support for financing and a rise in export figures from economies, this being most significant in those sectors that are more reliant on financing and that operate in countries with a limited development of their financial systems. The number of studies at a microeconomic company level has increased in recent years. Badinger & Url (2013) analyse, for the case of 178 companies in Austria, how credit guarantee systems are particularly effective in promoting internationalisation towards countries with a high credit risk and less effective in the case of multinationals. Heiland & Yalcin (2015) construct a panel of 521 companies and see how financial support increases the export probability, particularly among smaller companies, generating significant effects on employment. For their part, Felbermayr *et al.* (2012), employing counterfactual methodologies such as those proposed in this action plan, also find, in the case of Germany, that public guarantee support systems increased sales and create jobs, particularly during the financial crisis. More recently, Agarwal *et al.* (2019), using regression discontinuity techniques, found heterogenous effects between companies, although these are particularly significant among small and new companies. Other policies to support internationalisation have been studied in Spain, such as a programme to promote companies from Andalusia in Cansino *et al.* (2013), applying matching techniques, or the action of commercial offices of Autonomous Regions abroad, in Gil *et al.* (2015), using gravity models. Financial instruments have

been analysed in the field of innovation, an activity with close ties to internationalisation[21].

Accordingly, and following more recent literature, various counterfactual analysis techniques will be employed, such as the difference-in-differences method, matching methods and the discontinuity regression method which, combined, will allow us to see whether the instruments evaluated have positive effects on their export performance and on their economic performance. To achieve that, such variables will be considered as the export probability, the volume of exports, the level of employment, the added value and productivity, the evolution of which, among the group of beneficiaries of the instruments (treatment group), is compared with a similar group of individuals that have not benefitted from these or other programmes (control group). In addition, the heterogeneity of the effects will be studied according to the characteristics of companies and operations, and robustness tests will be carried out to ensure that the conclusions are as a result of the policies evaluated and not of other determinants (Agarwal *et al.,* 2019). On a complementary basis and conditional upon the information available, an analysis will be made, on the one hand, of whether, in the event of positive effects, these persist when the support ends; and on the other hand, an endeavour will be made to see whether this support fosters a diversification of the markets that Spanish companies have access to. In order to perform this exercise, it will be necessary to have detailed microdata at a level of operation of each of the instruments to be analysed.

On the other hand, the quantitative analysis outlined will be complemented by a qualitative study of the procedures established for the approval of the operations under the different internationalisation instruments, with the aim of better understanding their functioning and of identifying potential inefficiencies that limit their efficacy. The evidence on the impact of the instruments will be complemented by a procedural analysis (organisational, regulatory and performance-based) based on the documentation provided by those responsible for its design and management, with whom interviews and group discussions will also be held. Satisfaction surveys completed by users of the instruments will be analysed, along with the Survey on Perceptions of Support for Internationalisation (EPAI) and the surveys developed within the framework of the Report on the Evaluation of the Action Plan for the Internationalisation of the Spanish Economy 2017-2018[22] and an assessment will be made of whether it is necessary to develop new surveys to collect important information that is not available.

[21] See Huergo & Moreno (2017) for a revision of the literature.
[22] Pilot Survey on Support for Internationalisation (EPAI and EPAI-ICEX).

In addition, **close collaboration will be essential with those responsible for the design and management of the instruments evaluated** to see other aspects not contained in the related documents and to observe the feasibility of the projects.

2.1.4 Databases and other sources of information

In order to undertake this study, **at least the following information will be necessary:**

- Horizontal and sectoral strategies of the scopes of action of the instruments and action plans that implement them, along with diagnostic studies on which they are based.

- Laws, rules, regulations and other documents that establish the framework of action and a description of the instruments analysed.

- Information on budgetary provisions, portfolio and implementation of the instruments analysed.

- Annual reports, monitoring and evaluation reports on the instruments.

- In the case of instruments to support internationalisation, the documentation listed above will be required with the utmost level of detail and will be completed with the documentation relating to the procedural framework for the identification of a selection of operations, their definition, management, implementation and monitoring.

Furthermore, the quantitative analyses of the efficacy of the internationalisation instruments are based on the use of microdata on companies and operations from surveys and administrative registers, from which the evidence and conclusions of our evaluations are extracted. In particular, for this project, it will be fundamental to have:

- **Statistics and microdata recorded on the operations carried out under the financial instruments selected for their evaluation (FIEM, FIEX, FONPYME, COFIDES, ICO – as a public bank and a State financial agent - and CESCE),** with information on beneficiaries, destination country, type of operation, volume, monitoring indicators, etc.: these data will be extracted from the management and monitoring applications used by the bodies responsible for each instrument.

- **Microdata from the DIRCE of INE,** both of the beneficiary companies of the previous instruments and of the companies likely to form the control groups needed for the correct identification of the impacts, with information on the characteristics and the economic performance of the companies.

- **Microdata on foreign trade declared,** of the Department of Customs and Special Taxes of the Tax Agency, both of the beneficiary companies of the previous instruments and of the companies likely to form the control groups needed for the correct identification of the impacts, with detailed information on the exports made.

- **Microdata on the Foreign Investments Register (RIE) of the State Secretariat for Trade and on the Statistics of Subsidiaries of Spanish Companies Abroad of INE,** with detailed information on the direct investments abroad of Spanish companies, both of the beneficiary companies of the previous instruments and of the companies likely to form the control groups needed for the correct identification of the impacts.

- **Microdata on the Central Balance Sheet (CBI) of the Bank of Spain and of the Official College Land, Mercantile and Property Registrars of Spain,** with detailed information on the financial statements of companies, that facilitate the monitoring of their results.

- **Microdata on the Survey on Innovation of Companies of INE,** with detailed information on the innovative activities of companies, very closely related to internationalisation.

- **Microdata on Corporate Income Tax, of the Tax Agency,** with information on tax benefits for innovation by companies.

It will be necessary to cross-reference the information from most of the afore-mentioned databases with each other[23] with a view to collecting all the information in a single file on the characteristics of companies, the use of instruments and their results, both general and related to export operations and direct investment abroad.

Lastly, the period of analysis will depend on each instrument and will be determined together with those responsible for their design and management. To that end, the evolution of the different lines or programmes under each instrument will be taken into account, in other words, the potential modifications of their conditions or requirements that enable their impact to be evaluated, the availability of information and that a sufficient period of time subsequent to the operation has elapsed to analyse their results.

[23] These cross-references have a precedent in the database of the Characterisation of Export Companies and Companies with Export Potential, set up to evaluate the Two-Year Plan 2017 – 2018 of the Internationalisation of the Spanish Economy Strategy.

2.1.5 Governance and participating bodies

The governance of this project is structured in the following manner:

1) **AIReF will carry out the running, coordination, supervision and development of the evaluation.** To achieve that, in addition to its internal evaluation team, it may employ external resources specialised in the evaluation of policies at a financial or international trade level.

2) **The Ministry of Finance and Civil Service, through the State Secretariat for Budgets and Spending, will coordinate the project on behalf of the client**, ensuring the involvement of all the public bodies and institutions that are relevant, along with the availability of the information and microdata required to carry out this study. To this end, it will be AIReF's main point of contact with the Government, regardless of the bilateral relations AIReF may have with each of the units involved.

3) The **Ministry of Industry, Trade and Tourism,** the **Ministry of Economic Affairs and Digital Transition,** the **Ministry of Science and Innovation** and their related or dependent public bodies and enterprises will collaborate as the parties responsible for most of the financial instruments to support the productive sectors in the pillars indicated in Reform 1.b of Component 29 of the RTRP on the launch of Phase III of the Spending Review (internationalisation, innovation, digitalisation, industry and tourism). The participation of all those other ministerial departments that offer financial instruments that share goals with the aforesaid departments within their sphere of jurisdiction will also be necessary.

4) The **public enterprises, bodies and entities with responsibilities for internationalisation**, particularly those responsible for financial instruments in this field: **ICEX, CESCE, COFIDES** and **ICO.**

5) The **competent departments in the areas subject to study of the Autonomous Regions and their related public enterprises and entities.**

In addition, given the need to cross-reference the information to carry out the quantitative evaluations proposed above, **other necessary agents in the process are identified**, in particular:

6) The National Statistics Institute, as the agency responsible for the DIRCE, which contains information on the characteristics and performance of Spanish companies, the Statistics of Subsidiaries of Spanish Companies Abroad, with figures on direct investment abroad, and the Survey on Innovation of Companies.

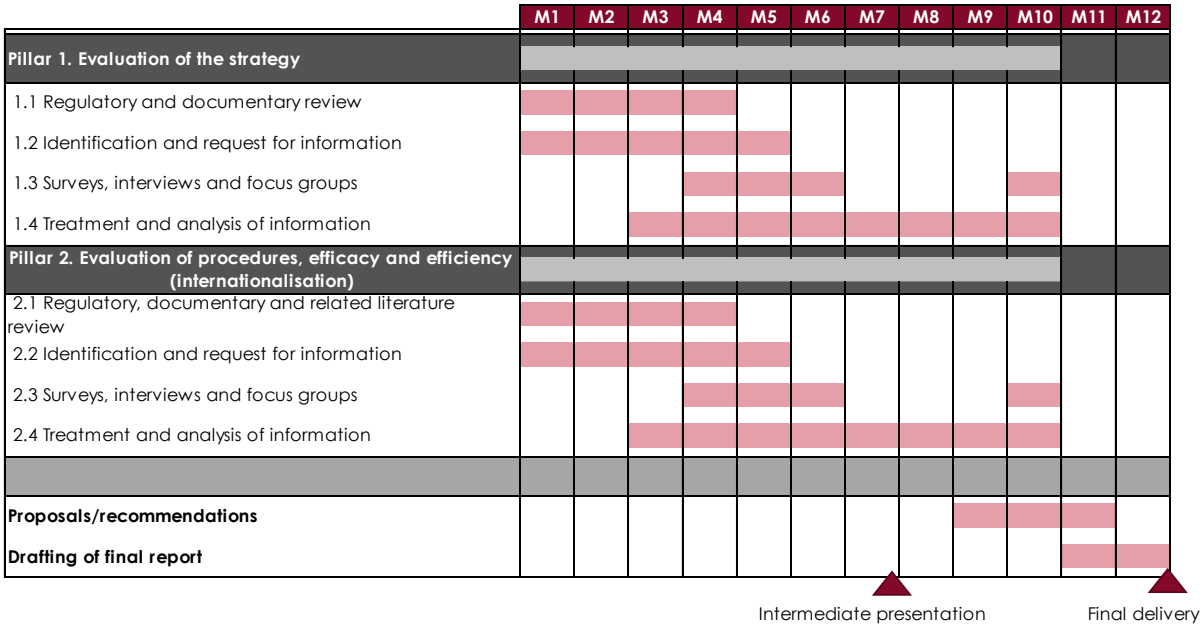
7) The Tax Agency, as the agency responsible for foreign trade figures declared by Spanish operators and for information on the tax benefits of companies.

8) The Bank of Spain and the Official College of Land, Mercantile and Property Registrars of Spain, as the agencies responsible for the databases of the Central Balance Sheets, drawn up based on the information that companies provide the Bank of Spain and their financial statements deposited at the Companies Registers, which facilitate the monitoring of their results.

2.1.6 Timeline

The maximum period to complete the work, once this action plan has been approved, will be twelve months from the effective incorporation of the external resources. In order to begin the calculation of the period, it will also be necessary for AIReF to have obtained the essential information to perform the evaluations.

Without prejudice to the foregoing, **an intermediate presentation of the results will be performed prior to 30 July 2022**.



2.2 Evaluation project 2: Urban waste management

2.2.1 Context

Context of the evaluation

Waste forms part of economic activity and its management has implications for productivity, public spending and the environment. Waste generates market failures in the form of negative externalities since economic decisions on production and consumption under free competition do not take into account the environmental consequences that they cause (DEFRA, 2011). Waste generates a great deal of environmental harm at a global and local level, such as the emission of greenhouse gases; air, soil and water pollution; the production of noise, smells and visual intrusion (Giusti, 2009; Magazzino *et al.,* 2020). These forms of harm also speed up climate change, have serious effects on health, damage crops and buildings and cause significant harm.

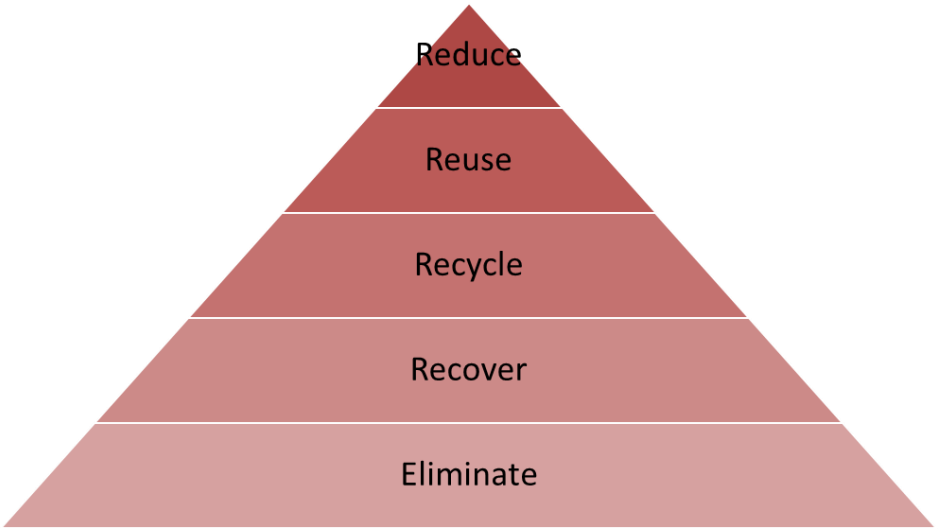
State intervention in this area is needed with a view to establishing a form of management that internalises, through the use of certain economic and fiscal instruments, the costs and externalities associated with the generation, recycling, transportation and elimination of waste. Accordingly, the structure of incentives must pursue the goal of achieving an optimum volume of waste that manages to bring the costs of reducing the waste in one unit in line with the economic and environmental benefits of generating one unit less. However, in addition to guaranteeing an efficient volume of waste at an aggregate level, the different instruments must optimise an efficient volume of waste at each level of the waste hierarchy (prevention, re-use, recycling, recovery and disposal). Without State intervention, the waste treatment option with the best environmental results may be penalised compared with treatment with the worst performance, due to the higher costs of the former. The quantification of externality requires that the costs of the different combinations of treatment and levels of hierarchy fully reflect the environmental externality of each option.

In addition to the externalities associated with the environmental consequences, other market failures and barriers limit the market from managing waste optimally. Illegal disposal may be considered a public asset (due to its unrivalled and non-exclusive nature) that requires the intervention of different tiers of government to establish waste collection and elimination systems. Furthermore, the market cannot satisfy the infrastructures needed for suitable collection due to the long recovery periods for the investments made and long-term planning difficulties. In addition, the new technologies associated with recycling require additional intervention to overcome the market failures associated with innovation.

The waste sector is a key element in the transition towards a green and circular economy (European Green Deal) and in achieving Sustainable Development Goals 12, 13 and 14 (2030 Agenda). The natural environment plays an important role in economic activity both directly, by providing resources and raw materials, and indirectly, by means of the services provided by the ecosystems (carbon absorption, water purification, nutrients cycle, etc.). Waste policy is a key element in ensuring that raw materials are used efficiently, however, as we pointed out above, since its value is not fully taken into account in economic decisions, this means that these resources are consumed excessively, requiring public intervention for their management.

Waste policy requires the creation of market conditions and incentives for companies and households such that they invest and take more efficient decisions in the use and consumption of resources at a lower cost for economic growth. The waste hierarchy (see **¡Error! No se encuentra el origen de la referencia.¡Error! No se encuentra el origen de la referencia.**) classifies the different waste management options according to environmental suitability. Following this hierarchy, prevention, with the aim of reducing its production, is the best management option, followed in this order by preparation for re-use, recycling, other forms of recovery (including energy) and lastly, elimination (disposal in a landfill). The aim of the application of the waste hierarchy is to shift most waste management actions to the higher rungs of the hierarchy. However, this does not include considerations of an economic nature, and hence it is not a complete guide for waste policy.

GRAPH 3. WASTE HIERARCHY



The Circular Economy and, in particular, waste management, is a key element of the Recovery, Transformation and Resilience Plan (RTRP). This Plan is the instrument called on to structure the raft of reforms and investments aimed at facilitating an economic recovery which, among other aspects, must contribute to making the transition towards a more sustainable model of growth a reality. Specifically, Component 12

"Spain's Industrial Policy 2030" includes specific reforms (C12.R2) and investments (C12.I3) on waste policies and fosters the circular economy. In this context, the investments associated with the implementation of the new waste management legislation and with guaranteeing compliance with the new EU targets on this matter are planned to be aligned with the needs identified by the European Commission for Spain in 2019[24].

Context of urban waste management policy

Spain is significantly behind in the percentage of waste it recycles, as it stands some 15 points below the targets set (Figure 4a), as well as in other indicators of the waste hierarchy. The European Commission warned about this in its 2018 Early Warning Report, as did the IMF in the Final Declaration of its 2020 mission. Furthermore, urban waste management must attend to the numerous and ambitious targets established within the European and national framework for each of the levels of the waste hierarchy. In particular, the percentage of preparation for re-use and recycling needs to reach 50% of all waste generated by 2020, with this rate increasing to 55% in 2025, 60% in 2030 and 65% in 2035 (See **¡Error! No se encuentra el origen de la referencia.** on targets for each phase of the hierarchy).

BOX 2. STRATEGIC TARGETS OF MANAGEMENT POLICY FOR EACH LEVEL OF THE WASTE HIERARCHY

	European legislation		State legislation [2]		Pr. Law	
	Target	Date	Target	Date	Target.	Date
Prevention						
Waste reduction generated compared with 2010			10%	2020	13% 15%	2025 2030
Per capita food waste reduction compared with 2020	50%	2030			50%	2030
Reduction in certain single-use plastics (glasses, lids, food containers, etc.) compared with 2022		2026			50% 70%	2026 2030
Annual consumption of plastic bags per person	90 40	2020 2025				
Re-use						
Re-use and preparation for re-use (of waste generated)					5% 10% 15%	2025 2030 2035
Recycling						
Separate collection of plastic bottles compared with volume introduced into the market	77% 90%	2025 2029			77% 90%	2025 2029
	50%	2020	50%	2020		

[24] European Commission (2019). Study on investment needs in the waste sector and on the financing of municipal waste management in Member States.

Preparation for re-use and recycling (of waste generated)	55% 60% 65%	2025 2030 2035			55% 60% 65%	2025 2030 2035
Recycling of containers (of weight introduced into the market)	65%/70%	2025/2030	70%	2020		
Recovery						
Maximum % of energy recovery			15%	2020		
Disposal						
Maximum % of municipal and landfill waste	10%	2035	35%	2020		

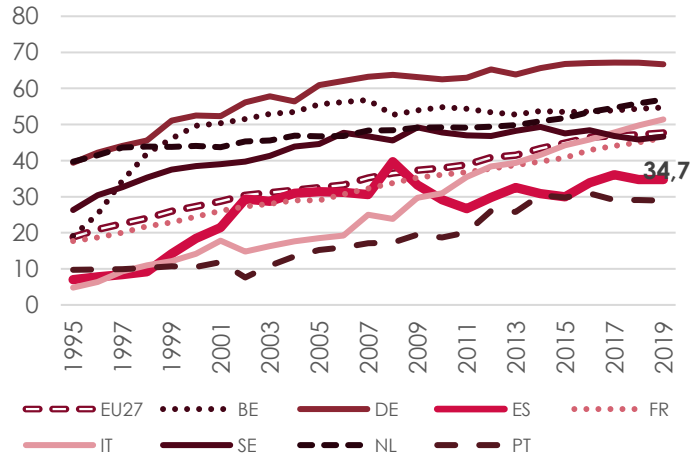
[1] Directive 2008/98/EC on waste (2018 consolidated version), Directive 94/62/EC on containers and waste from containers (2018 consolidated version) Directive 2019/904 on reduction of certain plastic products, Directive 1999/31/EC on the disposal of waste (2018 consolidated version)

[2] Waste and Contaminated Soil Act 22/2011, of July 28th, State Waste Management Framework Plan 2016-2022

In order to increase the percentage of recycling, it is necessary to improve the separated waste collection rates, which are well below the European average. As a result of this lack of separation, a comparatively high proportion of waste is disposed of in landfills without any type of treatment. According to the data available on household waste (Figure 4b), only 16% of household waste collected is separated in Spain, far from the average of 41% in the European Union, with very unequal performance across the Autonomous Regions (Figure 4c**¡Error! No se encuentra el origen de la referencia.**). Consequently, 54% of all waste is disposed of in landfills (Figure 4d**¡Error! No se encuentra el origen de la referencia.**), very far from the maximum threshold of 10% set by the European Commission for 2035.

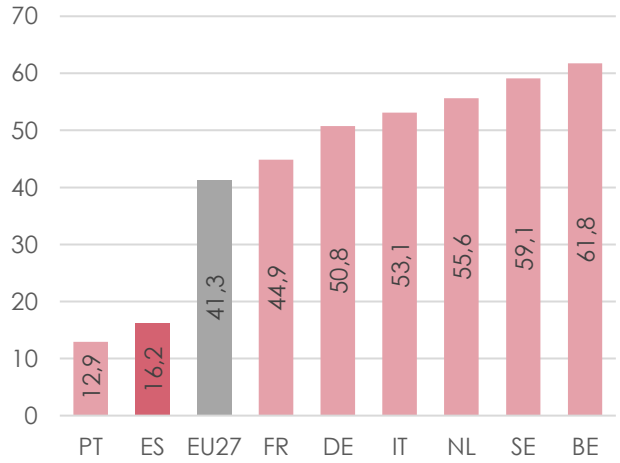
COMPARATIVE SITUATION OF TREATMENT OF WASTE

4a. Percentage of municipal waste recycled



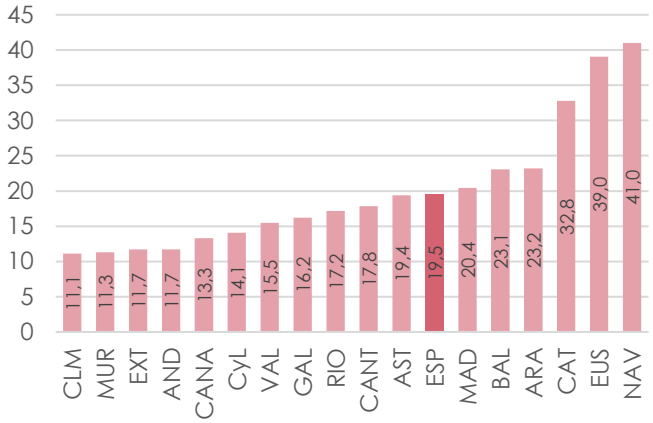
Source: AIReF based on Eurostat.

4b. Percentage of waste separated in Europe (2018)



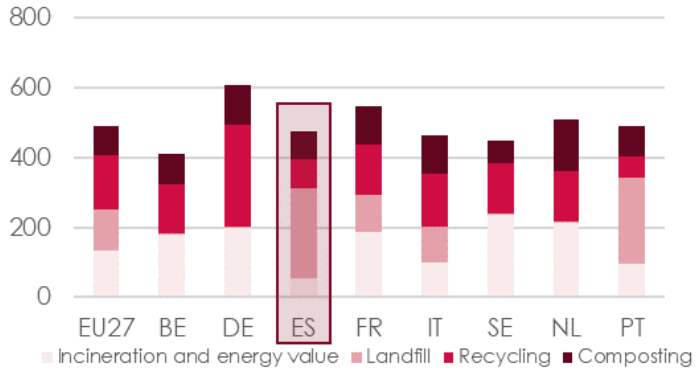
Source: AIReF based on Eurostat.

4c. Percentage of separated waste collected by AR (2018)



Source: AIReF based on INE.

4d. Treatment of municipal waste 2019 (kg/pc)



Source: AIReF based on Eurostat.

Waste management in Spain is characterised as an activity with jurisdiction widely spread among the different tiers of the General Government[25]. The preparation of the National Waste Plan; the establishment of the minimum targets on generation, re-use, recycling and recovery; the ratification of international treaties and the collection and preparation of information to comply with national and EU legislation fall to the Central State Administration, among other powers. The Autonomous Regions are entrusted with the preparation of regional prevention and management plans, the authorisation, inspection and sanctions on production and management activities, along with the registration of information on production and management. Local Governments are responsible, as an obligatory service, for the collection, transportation and treatment of domestic waste generated by households, businesses and services, along with oversight, inspection and disciplinary powers under their jurisdiction.

National legislation is framed within the guidelines established by the European Union in its different EU Directives on this matter, particularly in the Waste Directive, updated in 2018. Directive 2008/98/EC on waste is the main regulatory instrument to change the focus of waste management in Europe, by focusing the aim on prevention and recycling. The amendments to this Directive, introduced in 2018, are undergoing the transposition process to the Spanish legal system by means of the Draft Law on Waste

[25] Article 12 of the Waste and Contaminated Soil Act 22/2011, of July 28th, establishes the distribution of administrative powers.

and Contaminated Soil[26]. This draft law, apart from transposing the quantitative aims of the European Directive, includes different measures and regulatory, economic and fiscal instruments that seek to alter the conduct of agents to achieve such ambitious targets. Noteworthy is the establishment of the Special Tax on Non-reusable Plastic Containers, the Tax on Depositing Waste at Landfills and Incineration, the obligation on Local Governments to impose a differentiated, specific and non-deficit tax for the provision of its waste management services, while also fostering payment for generation.

It is worth highlighting the importance of Local Governments in achieving waste targets, since they have jurisdiction over the provision of collection and treatment, and with the monitoring of these operations and the obligation to provide information on achieving these targets. Consequently, the new guidelines on achieving these targets must be reflected in the corresponding municipal byelaws.

This evaluation will analyse national and international good practices, the efficacy of some instruments and incentives to achieve the targets, along with the needs of local authorities to address this new context.

2.2.2 Purpose and scope of the evaluation

The purpose of the evaluation of urban waste management that will be addressed in this phase of the Spending Review is to provide the General Government (central, regional and local) with a set of effective and efficient instruments to overcome the recycling and disposal challenges facing Spain and to achieve the targets set by EU and national law. The evaluation will be structured in three pillars of analysis, the results of which will contribute to providing public managers with a range of instruments for the effective and efficient management of waste under their jurisdiction, taking into account the territorial and socio-economic reality of said jurisdiction.

The scope of this study is limited to waste under local jurisdiction as defined in the Draft Law on Waste and Contaminated Soils. Waste under local jurisdiction is managed by Local Governments and includes, as an obligatory service, the collection, transportation and treatment of household waste; and optionally, the management of non-hazardous commercial waste, regardless of whether the producers of this waste can manage it themselves. For its part, household waste includes the waste generated in homes as a result of household activities. Household waste also includes similar waste in composition and volume to the aforesaid waste as a result of service and industrial activities. It is possible that, over the course of the study, data is

[26] Approved at the Council of Ministers on May 18th, 2021, submitted to Parliament and published in the Official Gazette of Parliament on May 28th, 2021. It is currently in its passage through Parliament at the Ecological Transition and Demographic Challenge Committee in the Congress [Lower House].

employed on types of waste that exceed this definition of waste under local jurisdiction, due to the availability of statistical information and/or the characteristics of certain phases of the management and treatment of waste.

We will now briefly list and describe the specific pillars that will form part of this evaluation:

An international comparison and a review of best international practices to achieve the targets set for waste will be made in Pillar 1.

The aim of this pillar will be to identify and describe the best practices at an international level that cover all areas of waste management, establish efficient waste collection that fosters re-use and recycling, encourage the preparation of waste for its re-use and the re-use of products. This should all be undertaken based on an in-depth analysis of the actions carried out by benchmark countries in the waste management sector, also searching for those practices that have a significant potential for their adoption in accordance with the territorial and socio-economic diversity of Spanish municipalities.

Pillar 2 will address the analysis of the national, regional and local situation of waste management under local jurisdiction. The strategies, indicators, infrastructure, management and instruments of the different tiers of government in the different phases of the waste management cycle will be studied in depth: prevention, collection, re-use, recycling, energy recovery and elimination. Given that the provision of this service falls to the municipalities, which can perform them independently or in association, and which may, in turn, opt for various forms of management, it will be necessary to spatially drop down as far as possible in the analysis. However, given the lack of availability of homogenous and quality public information at a local level and the broad scope of the study, information will be collected for a representative sample of the municipalities and of the supra-municipal entities entrusted with waste management.

Pillar 3 will evaluate, by means of the case studies, the efficacy of certain instruments and economic and tax incentives in achieving the strategic aims through the use of counterfactual techniques. The aim will be to identify and select cases with certain characteristics and the availability of data that allow counterfactual techniques to be applied to analyse the impact of the different regulatory, economic and tax instruments in achieving the strategic aims of reducing waste, increasing the percentages of recycling and re-use, along with a reduction in incineration and disposal. To the extent that information is available, the possibility of applying a cost-benefit analysis, a data envelopment analysis and a stochastic frontier analysis will be assessed to evaluate efficient waste management.

The results of the evaluation will be set out in a document organised in three blocks: the first will describe the purpose of the evaluation, the proposed analyses and the methodologies and databases used; the second will contain the evidence found as a result of the evaluation for each of the pillars of the analyses and the third will structure realistic proposals to achieve the European targets, in which the different starting points, characteristics and realities of each tier of government involved in the process will be particularly taken into consideration.

2.2.3 Methodology

The review of best international practices and analysis of the national, regional and local situation - Pillars 1 and 2 of the evaluation - will require the application of different qualitative and quantitative analysis methodologies, although the use of the former will predominate for these pillars. The methodologies to be used will be the following:

Qualitative analysis methodologies

Review of applicable legislation and regulations within the scope of the evaluation at an EU, State, regional and local level.

Documentary revision of waste management and prevention strategies, programmes and plans, along with the circular economy, together with such other documentation as manuals, guides, monitoring and evaluation reports, etc.

Benchmarking and identification of good practices at an international level, which will provide the basis for the formulation of proposals on the most successful and applicable experiences for the case of Spain.

Comparative analysis of waste management under local jurisdiction at an international, national, regional and local level.

Questionnaires/surveys as sources of complementary information to the data of public authorities. Questionnaires will be sent with a view to collecting homogenous information on waste management under municipal jurisdiction (provision of infrastructure, forms of management, collection and treatment, etc.) These questionnaires will be sent to:

- Regional departments with jurisdiction over waste management.
- Local Governments in charge of waste management (town councils, associations of municipalities, districts, consortiums, provincial and *foral* councils, etc.).

- Waste management concessionaires.
- Integrated Waste Management Systems (SIGs).
- Owners of waste storage, treatment, incineration and landfill plants.

Interviews with stakeholders: with a view to looking in depth at the aspects addressed in the questionnaires, meetings will be organised with managers of the different agents involved in the waste management process (General Government, waste managers, integrated management systems and sectoral associations, consumer associations, ecological groups, etc.). The holding of interviews with important stakeholders is essential to obtain information first hand from the agents involved and to collect information that has not been obtained in the questionnaires or in the rest of the fieldwork, and in order to integrate different focuses from the elements evaluated.

Quantitative analysis methodologies

The empirical literature has analysed different instruments of waste management policy applying counterfactual techniques, fundamentally the difference-in-differences (DiD) and discontinuity regression methods, showing in many cases the efficacy of certain economic and fiscal instruments and incentives. Several authors have evaluated instruments of a regulatory nature. Dhanorkar & Muthulingam (2020) reveal that the introduction of a **law imposing the recycling** of electronic waste in the state of California not only had an impact on reducing electronic waste, but also on reducing the total volume of solid municipal waste by 4.93%. For their part, Rasek & Smuda (2018) evaluated the impact of the entry in force of a **law that introduced competition** in the German waste management monopoly of containers in 2004 and observed a price reduction of 63% and benefits in terms of consumer wellbeing of a total of €13bn up to 2011. Unlike these authors, which employ the difference-in-differences technique, Akbulut-Yuksel & Boulatoff (2021), using a discontinuity regression design, examined the efficacy of the adoption of a moral incentive policy, specifically the obligation to use transparent rubbish bags in a municipality in Canada. These authors observed that, over a period of two years, recycling increased by 15% whole solid municipal waste fell by 27%.

Various economic and fiscal instruments have also been evaluated in the literature, proving to be highly effective in general. Payment by volume by means of a tax per rubbish bag has been evaluated by Tsai & Sheu (2009) in Taiwan and by Carattini *et al.* (2018) in the Swiss canton of Vaud, among others. Tsai & Sheu observed that this system reduced the volume of waste generated, but that its impact on recycling was not significant. They also observed a negative externality given that they estimated that 60% of the reduction in the generation of waste was due to an increase in illegal dumping in neighbouring areas. However, Carattini *et al.* observed how effective this

instrument was in reducing the amount of mixed waste and in increasing the recycling of aluminium and biowaste, all without causing significant negative waste in neighbouring areas. Furthermore, the effects lasted over time in this case. Payment by weight of rubbish has also been evaluated. Jaeger & Eyckmans (2015) evaluated, by means of DiD and matching, the impact of the change from a payment per rubbish bag system to a more sophisticated payment by weight system in certain Flemish municipalities. They concluded that the introduction of a payment by weight system had a significant and substantial impact on reducing the volume of solid municipal waste per capita. For their part, Allers & Hoeben (2010) estimated the effect of payment per unit of rubbish (volume or weight) for a group of Dutch municipalities. The effect of the payment system on reducing the weight generated was greater in the payment per weight system than in the payment per volume (bag) system. These payment systems also had a positive impact on the recycling tax, although not so much as in reducing waste. Lastly, Compagnoni (2020) analysed the impact of the introduction of a pay as you throw (PAYT) system in the Italian region of Emilia Romagna on the total and separated volume of waste, estimating a 9.6% reduction in the total volume of waste generated, but an insignificant impact on increasing separated waste.

Hence, and following the literature cited, various counterfactual techniques will be employed, such as the difference-in-differences method, the discontinuity regression design and matching methods, which will allow the effect of the different instruments selected to be evaluated in achieving the strategic goals established for the different levels of the waste hierarchy. To achieve that, it will be necessary to revise the empirical literature to evaluate the impact of waste management, select the economic and fiscal instruments and incentives to be evaluated, identify a sample of a significant number of municipalities as treatment and control groups, select the variables of interest, collect the necessary quantitative information and apply counterfactual techniques, such as difference-in-differences, discontinuity regression and matching, and others according to the data available, taking into account the unobserved heterogeneity and other relevant methodological questions and a robustness analysis that ensures that the estimated effects are attributable to the instruments evaluated and not to other determinants.

2.2.4 Databases and other sources of information

In order to undertake this study, it will be necessary to obtain at least the following information:

- Legislation and regulations that affect waste management at an EU, State, regional and local level.

- Waste prevention and management strategies, programmes and plans, along with the circular economy, at an EU, State, regional and local level.

- Manuals, guides, annual reports and monitoring and evaluation reports.

- Statistics on waste generation, collection and treatment.

- Information on the provision of waste management infrastructures (number of containers, type of collection, treatment plants, storage capacity, etc.).

- Characterisation of the collection zones (municipality, extension, houses, linear kilometres of the collection route).

- Information on the forms of management (direct, concession, contract, etc.).

- Information on the methods of collection (containers, pneumatic, door-to-door, etc.) and frequency.

- Information on service provision costs.

- Information on economic and fiscal instruments, taxes and other income from waste management.

The quantitative analysis of the efficacy of certain economic and fiscal instruments and incentives will require the use of microdata at the highest level of spatial disaggregation possible (municipal) from public or restricted databases or questionnaires that will have to be combined on some occasions. In particular, in this project, the following databases and sources of information needed have been identified to date:

- Survey on local infrastructure and equipment (EIEL).

- Effective cost of services provided by Local Governments (CESEL).

- Consultation on budgets and settlements of Local Governments (CONPREL).

- The information that the Autonomous Regions maintain up-to-date, with the collaboration of Local Governments, on waste management in their sphere of jurisdiction, including the infrastructure available and, in each of these, the quantification and characterisation of ingoing and outgoing waste, the specific recovery and elimination of outgoing waste destinations (Article 41 of Law 22/2011).

- The information obligations of waste treatment companies contained in Annex XII of Law 22/2011 (type of waste, volume, origin and treatment operation).

- Register of production and management of waste (contains the communications and authorisations derived from Law 22/2011).

- The administrative and management databases of different General Government bodies within the scope of their jurisdiction on waste management (MITECO, ARs, LGs).

2.2.5 Governance and participant bodies

The governance of this project is structured in the following manner:

1) **AIReF will perform the management, coordination, supervision and development of the evaluation.** To achieve that, in addition to its internal evaluation team, it may include external resources specialised in the evaluation of waste management policies.

2) **The Ministry of Finance and Civil Service, through the State Secretariat for Budgets and Spending, will coordinate the project on behalf of the client**, ensuring the involvement of all the public bodies and institutions that are relevant, along with the availability of the information and microdata required to carry out this study. To this end, it will be AIReF's main point of contact with the Government, regardless of the bilateral relations AIReF may have with each of the units involved.

   In particular, it will manage the coordination and contacts and **will be responsible for ensuring the information is provided to carry out the project**.

3) **The Ministry for Ecological Transition and Demographic Challenge, through the Directorate-General for Quality and Environmental Evaluation and the Waste Coordination Committee attached to this ministerial department.**

4) **The regional departments with jurisdiction on waste.**

5) The **local authorities (municipalities, districts, provincial and *foral* councils, etc.)** that provide waste management services. Given the large number of this type of entity, the contact will be coordinated through **SGFAL** and the **Spanish Federation of Municipalities and Provinces (FEMP).**

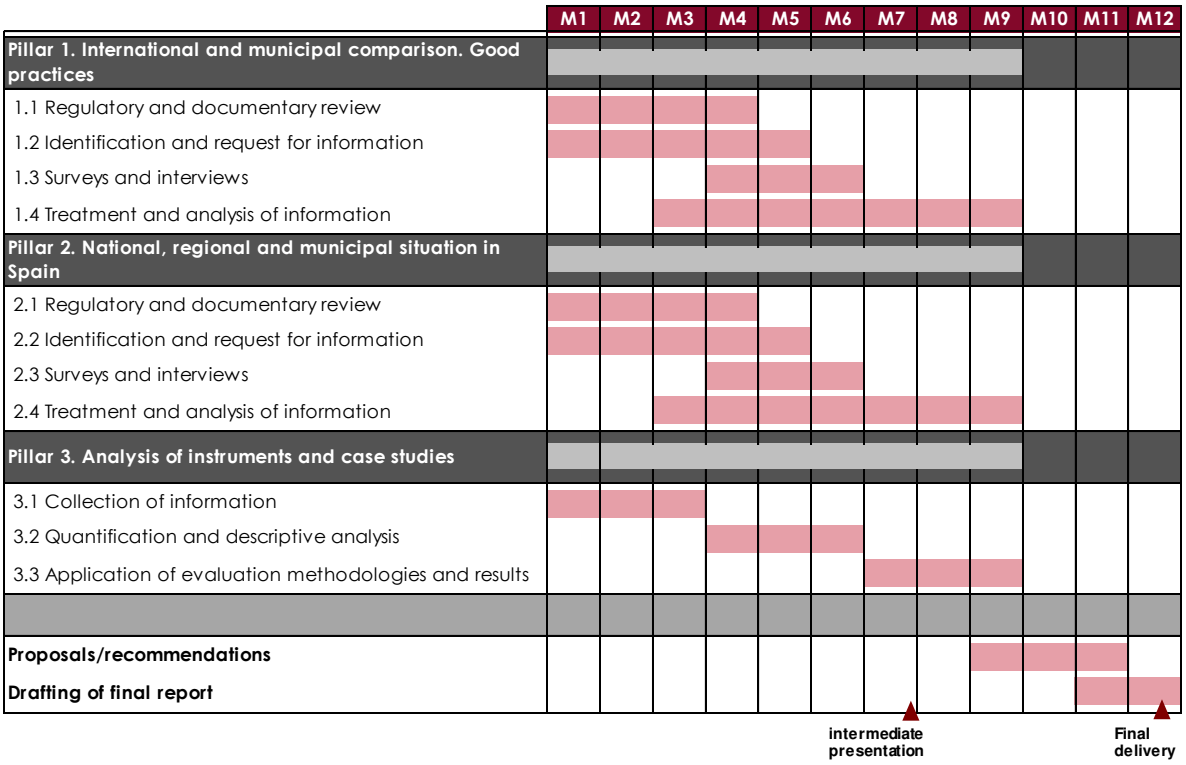
6) **Private organisations**: waste managers, owners of waste treatment plants and extended collective responsibility systems of producers, among others.

2.2.6 Timeline

The maximum period to complete the work, once this action plan has been approved, will be twelve months from the effective incorporation of the external resources. In

order to begin the calculation of the period, it will also be necessary for AIReF to have obtained the essential information to perform the evaluations.

Without prejudice to the foregoing, **an intermediate presentation of the results will be performed prior to 30 July 2022**.



3 BUDGET

Pursuant to the provisions of Article 11.2 of Organic Law 6/2013, of November 14th, creating AIReF, and of Articles 23 and 43.5.b of Royal Decree 215/2014, of March 28th, approving the Organic Charter of AIReF, the performance of studies by this institution will entail the receipt of the corresponding public prices.

Prior to carrying out a study, AIReF must draw up a budget and a timeline for its development, which must be forwarded to the interested public authority for its confirmation. It should be highlighted that AIReF plans to contract, for such aspects as are necessary, the collaboration of external resources. In this regard, AIReF will enter into service contracts to perform activities of a material, technical and service nature as required to prepare the study it is commissioned with.

The budget for this study has been determined pursuant to the provisions of the **Independent Authority for Fiscal Responsibility Resolution of December 18th, 2019, updating the public prices to prepare studies** (OSG of December 23rd, 2019) and making a cost estimate of the technical assistance to be contracted according to its experience in previous public tenders.

The total amount of the budget is 950,000 euros (not subject to VAT, in accordance with the provisions of Report AUIE/MAEC 81/19, of the State Legal Service, of March 18th, 2019), distributed as follows:

- **Financial instruments to support the productive sectors:** 460,741.75 euros, with the following breakdown:
    - 415 hours AIReF: 44,479.70 euros
    - Estimated cost of external technical assistance: 416,262.05 euros
- **Urban waste management:** 489,258.25 euros, with the following breakdown:
    - 450 hours AIReF: 48,231.00 euros
    - Estimated cost of external technical assistance: 44,027.25 euros

This distribution, both between projects and between the number of AIReF staff hours and the cost of the external technical assistance to be contracted, may be adjusted according to the needs and evolution of the projects, respecting, at any event, the total amount indicated above, which will constitute the maximum spending limit for the Ministry of Finance and Civil Service.

The payments will be made following the submission of the corresponding invoice by AIReF, pursuant to the provisions of Royal Decree 1619/2012, of November 30th, regulating invoicing obligations and of Law 25/2013, of December 27th, promoting electronic invoices.

As a pre-requisite to commencing the work, once this Action Plan is approved, the Ministry of Finance and Civil Service shall make a **preliminary deposit of 20%** of the cost estimate by way of an advance payment on account of the settlement to be finally effected. The last invoice to be submitted by AIReF shall be the final settlement, which will contain the number of AIReF staff hours finally employed and the actual cost of the technical assistance contracted.

4 PUBLICITY

The Ministry of Finance and Civil Service expressly authorises AIReF to publish the studies on its web page and its dissemination by means of the different methods of communication that are finally agreed on with said ministerial department. AIReF will notify the methodologies employed in the evaluation to the Ministry of Finance and Civil Service.

5 REVISION AND MODIFICATION OF THE ACTION PLAN

This Plan should be understood to be a general framework that may be subject to subsequent modifications as and when necessary in light of the evolution of the work and according to such new needs as may arise. Any modification shall be notified to the Ministry of Finance and Civil Service and duly justified.

6 REFERENCES

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