Chapter 12

Circular Economy in National Smart Specialization Strategies: The case of Greece

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Abstract

Greece is lagging significantly behind the EU average in the process of transition from the linear to the Circular Economy (CE). The country needs significant acceleration to catch up and new tools may be necessary, as old good intentions proved ineffective. Monitoring indicators, European Semester recommendations, fines by the Court of Justice and national/international NGO assessments leave no doubt for that. At the same time the main advantage of the country are high quality research skills. This chapter[5] presents a mapping exercise aiming at assisting the Greek Authorities in using the national and regional Smart Specialisation Strategies (SSS) to contribute to facilitating and accelerating the transition of the country to the CE. The combination of these two EU priority strategies and policies, totally distinct in terms of timing and primary target, pose significant challenges in terms of methodology, prioritisation and project coordination. The main lesson drawn from the Greek exercise is that the CE transition can be accelerated and become profitable, if using a cross-referencing methodology of SSS and CE strategy goals. This can be done only if adapted for the needs and competitive advantages of each country or region.

Key words: circular economy, smart specialisation strategy, policy recommendations, Greece

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12. 1 Introduction

This research is about the mapping exercise aiming at assisting the Greek Authorities in using its Smart Specialisation Strategy (SSS) thus facilitating and accelerating the transition of the country to the Circular Economy (CE). It describes the process of a pilot, supported by the EIT Climate KIC, which can be used as a model by other Member States wishing to couple their own SSS and CE strategies. The methodology followed consisted of desk research, interviews and a stakeholder consultation workshop conducted in September 2019 at the Ministry of Energy and Environment.

The project investigated the possibility to obtain synergies from the coordination of two top priority European Union (EU) policies, namely SSS as a major tool of regional development policy and the Transition to the CE as a main concern of environment policy:

The circular economy strategy. For a long time, environmental policy in Greece was (unsuccessfully) focusing almost exclusively on waste management with few exceptions. CE projects were fragmented, often considered identical to material recycling. Following the EU legislation and the Communication of the Action Plan for the CE, the Greek Ministry of Environment and Energy adopted the National Circular Economy Strategy. Suggesting a methodology for refining and implementing this Strategy was the goal of the project described here.

The Smart Specialisation Strategy. The adoption of a SSSs was an ex ante conditionality for the first time in the 2014-2020 programming period. Designing such a strategy created some unrest and a concern that focusing on few areas for Thematic Objectives 1 and 2 might discourage investments in the non-prioritised sectors of the economy. In addition, the timing did not allow for a systematic coordination between SSS and Operational Programmes (OPs). Due to the severe economic crisis, the European Structural and Investment Funds (ESIF) were the main source of development funding. Nationally funded investments at the time shrank to a minimum because of the need to generate budget surpluses.

The combination of two totally distinct strategies and policies both in terms of timing and primary target poses significant challenges in terms of methodology, prioritisation and project coordination.

The rest of the paper is structured as follows: In Section 2 we look at the external influences that have pushed the country towards the CE, their influence and potential incentives. In Section 3 we discuss the Greek context in more detail, looking at the indicators characterising the relative position of Greece in the adoption of the CE, as well as the design and implementation of the SSS. We then, in Section 4 describe the methodology used to assess common elements of the two strategies in the past. This methodology can prove invaluable if used ex ante in the next programming period rather than ex post. Conclusions, summarising the lessons learned and venturing some recommendations are included in Section 5.

12.2 External influence

CE is mainstream in international organisations. The United Nations (UN) Sustainable Development Goals (SDGs) and the EU Circular Economy Action Plan constitute the most prominent efforts promoting the CE influencing/supporting policy agendas in all their members (UN, 2020; European Commission, 2020). The UN SDGs are devised as a global, generic inspirational framework, whereas the EU regulatory framework is partly mandatory and partly discretionary with

increasing incentives for its implementation creating obligations and opportunities for the Member States.

12.2.1 The United Nations Sustainable Development Goals (SDGs)

The SDGs address the CE in the context of sustainability. Appendix 1 offers an overview of the CE-related content directly or indirectly included in the Sustainable Development Goals, as well as, their respective targets and indicators. The distinctive feature of the SDGs is that, unlike the Millennium Development Goals, they address for both developed and developing countries. The SDGs are neither binding nor does the UN directly fund or otherwise support their integrated implementation but uses them as guidance for the developing countries' support by the various UN organisations, like UNDTAD, UNDP etc. For the developed countries they constitute an aid to national policies and are taken over by the OECD and the EU to be translated into more specific recommendations.

For Greece, which is a developed, yet middle-income country, four main lessons are derived for the design of its national CE strategy. The SDGs suggest regulatory interventions for practically all areas related to the CE with emphasis on the special treatment of hazardous waste, recycling/reuse of waste as well as sea and forest management. At least equally important to regulation are incentives for the private sector and civil society. The important role of technology for a profitable CE indicates that Research and Innovation (R&I) incentives can be reinforce the role of the business sector and accelerate the transition. Several areas like wastewater treatment, renewable energy and energy efficiency, material consumption and production can benefit from CE-targeted R&I. While the primary sector plays a small role for GDP and employment in developed countries it is important for the CE is disproportionately relevant: sustainable agriculture, supported by new technologies, precision agriculture and photonics, will contribute to the CE via sustainable food production. Competent public authorities, ministries or otherwise, are expected to join forces for introducing a CE strategy for agriculture. This is achievable in the short to medium term. Finally, specific additional tools from the public sector include green public procurement and monitoring of the carbon footprint and CE indicators, while from the private sector CSR reporting will improve the business contribution.

12.2.2 The Circular Economy Transition in the EU

The EU has been very active early on in its vision for environmental protection and has integrated more aspects and policies in the introduction of the CE for its Member States on 2 December 2015, when the European Commission put forward a package to support the EU's transition to a Circular Economy including an Action Plan with specific 54 actions (European Commission, 2020). On 4 March 2019, the Commission informed on the complete execution of the action plan claiming that all 54 actions been delivered or are being implemented. This is expected to not only protect the environment and generate sustainable growth but also create jobs, contribute to boost Europe's competitiveness, modernise its economy and industry. Hence, the influence of the EU CE strategy for the Member States is multi-faceted: legally binding, inspirational, and providing incentives.

The EU Action Plan for the Circular Economy outlines a set of both general and material-specific actions. While some obstacles to a circular economy are generic, different sectors and materials face specific challenges due to the particularities of the value chain.

General measures include product design, production process, consumption, from waste to resources (secondary raw materials), innovation, investment and other cross-cutting issues. While actions for specific materials and sectors include plastics, food value chain, critical raw materials, construction and demolition, biomass and bio-based products, review of fertilisers legislation.

Many Directorates General (DG) of the European Commission, with a prominent role played by DG Environment, DG Grow, DG Research and Innovation and DG Energy are directly or indirectly involved in the transition to the CE, using technical assistance, policy advice and financial incentives to support Member States in their national policies. For the purposes of this chapter, we focus on the support provided by DG Regional Development, which co-designs the use of European Structural and Investment Funds (ESIF) with the Member States and encourages them to use to support the CE, using the following investment priorities[6]:

Table 1: Investment Priorities potentially associated with the Circular Economy

6.1	investing in the waste sector to meet the requirements of the Union's environmental acquis and to address needs, identified by the Member States, for investment that goes beyond those requirements
6.2	investing in the water sector to meet the requirements of the Union's environmental acquis and to address needs, identified by the Member States, for investment that goes beyond those requirements
6.6	promoting innovative technologies to improve environmental protection and resource efficiency in the waste sector, water sector and with regard to soil, or to reduce air pollution
6.7	supporting industrial transition towards a resource- efficient economy, promoting green growth, eco-innovation and environmental performance management in the public and private sectors
7.3	developing and improving environmentally friendly (including low-noise) and low-carbon transport systems
7.5	improving energy efficiency and security of supply through the development of smart energy distribution, storage and transmission systems and through the integration of distributed generation from renewable sources

While the ESIF/SSS is an incentive for the CE, in parallel with recommendations and encouragement the European Commission uses the process of the European Semester to provide a framework for the coordination of economic policies across the European Union. It allows EU countries to discuss their economic and budget plans and monitor progress at specific times throughout the year. Each year, the Commission undertakes a detailed analysis of each country's plans for budget, macroeconomic and structural reforms. It then provides EU governments with country-specific recommendations for the next 12-18 months. The Green economy is one of the themes addressed in this context and in includes environmental issues, though not yet directly the CE.

[6] The Partnership Agreement between the EU and the Member States foresees the Operational Programmes to report based on specific Thematic Objectives and Investment Priorities, subject to the priorities decided in each Member State.

12.3 The Greek context

12.3.1 Snapshot of the Greek CE performance

Compared to the EU average Greece scores rather unsatisfactorily in its transition towards the CE. As demonstrated by Table 2 the country generates more municipal waste per capita or GDP with the exception of Generation of waste excluding major mineral wastes per domestic material consumption, which is the only case it outperforms the EU average. It has a worse than average performance in all waste management with recycling rates being between 1/4 (in the case of biowaste) and close to the EU average (Recovery rate of construction and demolition waste). The performance is at the order of magnitude of 1 to 10 in all Secondary Raw Material indicators, while it is also underperforming in Competitiveness and Innovation (Table 2).

In a nutshell Greece is lagging significantly behind the EU average in its transition to the CE and needs significant acceleration to catch up.

Table 2: Circular Economy Indicators (Source: Eurostat (2019))

Indicator	Value	
	EU	**GREECE**
Production and consumption		
1. EU self-sufficiency for raw materials (percentage)	36.4	N/A
2. Green public procurement	N/A	N/A
3. Waste generation		
Generation of municipal waste per capita (Kg per capita)	486	504
Generation of waste excluding major mineral wastes per GDP unit (Kg per thousand-euro, chain linked volumes (2010))	65	78
Generation of waste excluding major mineral wastes per domestic material consumption (percentage)	13.5	11.5
4. Food waste (million tonnes)	80	N/A
Waste Management		
5. Recycling rates		
Recycling rate of municipal waste (percentage)	46.4	18.9
Recycling rate of all waste excluding major mineral waste (percentage)	57	N/A
6. Recycling / recovery for specific waste streams		
Recycling rate of overall packaging (percentage)	67.2	66.1
Recycling rate of plastic packaging (percentage)	42.4	38.2
Recycling rate of wooden packaging (percentage)	39.8	21.9
Recycling rate of e-waste (percentage)	41.2	34.2
Recycling of biowaste (kg per capita)	81	21

Recovery rate of construction and demolition waste (percentage)	89	88
Secondary raw materials		
7. Contribution of recycled materials to raw materials demand		
End-of-life recycling input rates (EOL-RIR) (percentage)	12.4	N/A
Circular material use rate (percentage)	11.7	1.3
8. Trade in recyclable raw materials (tonne)		
Imports from non-EU countries	5,905,135	536,071
Exports to non-EU countries	36,934,824	419,422
Intra EU trade	53,035,741	525,195
Competitiveness and innovation		
9. Private investment, jobs and gross value added related to circular economy sectors		
Gross investment in tangible goods (percentage of gross domestic product (GDP) at current prices)	0.12	0.04
Persons employed (percentage of total employment)	1.73	1.65
Value added at factor cost (percentage of gross domestic product (GDP) at current prices)	0.98	0.35
10. Number of patents related to recycling and secondary raw materials	338.17	0.5

The rather disappointing situation of the country concurs with the most recent European Semester Country Specific Recommendations document for Greece (June 2019), where it is stated that "Treatment of solid waste and urban and industrial wastewater is the main area needing additional investment in order to align the country's environmental protection standards with the rest of the EU. The management of solid waste continues to be a major structural challenge, with Greece still relying heavily on landfilling and mechanical-biological treatment instead of more modern techniques.

In addition, the proportion of municipal waste that is recycled is only about a third of the EU average. Investments are also needed to improve water treatment, combat groundwater salinization, and support measures to prevent flooding and restore the natural flow of rivers" (European Commission, 2019). Moreover, the EU Court of Justice has imposed more than 100 million Euros of fines on Greece for non-compliance with EU law provisions in the fields of solid waste and urban wastewater treatment (European Commission, 2019b; WWF, 2019).

The EU is not the only one to express worries, WWF is systematically animadverting the country for its environmental performance, while this is confirmed by many national and international NGOs. The new exploration for oil in the Aegean Sea is one of the controversial issues for these organisations.

12.4 Policies and governance for the CE

12.4.1 The legal landscape before the Introduction of the CE Strategy

The predecessor to the CE policy in the country was waste management and to a lesser extent R&I support measures for improvements in the energy and environment. The first law on recycling was adopted in 2001 (Law 2939/2001) but Greece has failed to achieve the targets it had set for itself on recyclables collection. This is attributed both to an inadequate mix of policies, to lack of incentives and to inadequate resources to the Municipalities and citizens. The choices made were for very large and expensive recycling units with long delivery contracts processing large quantities of mixed waste. These options failed.

A most recent Law adopted by the Parliament in 2017 (4496/2017) provides for sorting waste at the source, as well as ecological waste management. The aim of the government's policy in the programming period 2014-2020 was to harmonise Greek legislation with the European institutional framework, so that by 2020 at least 70-80% of recyclable waste is collected at source. This objective was expected to be achieved at the municipal level with the participation of citizens, so that waste could be used as an important source for saving valuable and endangered raw materials.

This Law was characterized by the introduction of a fee for plastic bags (which has since been introduced with spectacular impact on the reduction of plastic bags) and the introduction of specific measures to reduce the use of the plastic bag, in line with the provisions of Directive 2015/720/EU; the gradual achievement of new national targets and the reduction of waste resulting in landfill, below 30% by 2020; the creation of a National Public Information System; and the upgrading of the recycling quality by requiring separate collection at source in at least four streams (containers) of packaging. Moreover, sort at the source becomes mandatory in public spaces and utilities, operations in municipalities are optimising through incentives and disincentives, local Management Plans are formulated by the Municipalities themselves, controls are intensified and sanctions to stop producer avoidance to pay recycling fees are strengthened, while the Greek Recycling Organization (EOAN) is strengthened in human resources and organisational structure and both citizens and municipalities are incentivized to participate in recycling.

The implementation was a disillusionment, mainly because of critical issues in this effort of modernising. There are frictions and opposing interests both at the different administrative levels (national, regional, local), as well as between the public and the private sector, while there have been significant regulatory omissions and missteps (because of the lack of regulation for recycling cooking oil municipalities abandoned all efforts as they risked being treated as oil smugglers). Waste management projects generating revenue, fully or even partially commercial activities, require the control of competition rules and affecting the level of public funding. The control over the application of state aid rules to all operations has evolved into a deceleration factor (Mamalougkas, 2019).

12.4.2 Policy design and implementation

Design and implementation for an encompassing environmental protection and energy policy is under the authority of the Ministry of Environment and Energy, while thematic ministries, like the Ministry of Rural Development and Food, the Ministry of Shipping and the Aegean and the

Ministry of Health take initiatives in the domain of their responsibilities. The Ministry of Development and Investments plays a decisive role in its role of designing and funding incentives for R&D as well as business investments. The major source of national funding comes from the ESIF, organised in Sectoral Operational Programmes and Regional Operational Programmes. In the latter case an amount is foreseen for each region which is partly executed at the regional level and partly at municipal level. Hence, environmental missions are municipal, regional and national ESIF-co-funded projects. Additional support is offered by the EU competitive calls (H2020, LIFE, COSME, European Territorial Cooperation Programmes, EIT KIC Greek Hub and NGO funded).

Policy Implementation has until now not been sternly centrally monitored. This affects the ability to systematically collect the necessary data to construct pertinent indicators. Beside the centrally coordinated Operational Programme for Transport Infrastructure, the Environmental and Sustainable Development the are many uncoordinated individual projects.

As pointed out in the European Semester Recommendations solid, at this stage waste management is the most serious challenge for environmental protection and an opportunity for the transition to the CE. It remains heavily reliant on landfill (82% compared to 24% on average in the EU) and mechanical-biological treatment, as opposed to more modern techniques. Greece is at high risk of being unable to meet the EU's revised prevention and recycling targets (50% by 2020), as only 17% of municipal waste is currently recycled compared to an average of 46% in the EU. Despite declining in recent years, there are still some illegal landfills, resulting in costly infringement procedures for failing to comply with EU law on landfill and hazardous waste management.

However, progress has been made on the legal and institutional measures taken to increase the recycling of waste and to broaden EPR systems. The strategic framework for waste management is now being implemented with the approval of national and regional waste management plans. However, the use of financial means to incentivise prevention, reuse and recycling is inadequate and existing systems appear to be lagging behind expected performance. Recycling has been gaining momentum but is still suffering from friction at the various administrative levels and the lack of a definitive and generally accepted governance structure, while production and consumption policies have not been a policy focus in the past. An initial mapping of actions includes:

(a) ***Research and innovation, GSRT*** [Gen. Sec. R&D] & NSRF Actions: 39 Integrated Research Proposals for the 2016-17 two-year period; There are two important actions in progress, namely the *electronic platform of secondary materials at the Balkan level (INTERREG)* at the initiative of EDSNA [Association of Municipalities in the Attica Region – Solid Waste Management] and the participation of the Ministry of Environment and Energy; and the *Environmental and Circular Economy Park of the Municipality of Heraklion* (UIA) at the initiative of ESDAK [Association of Solid Waste Management of Crete];

(b) ***An inter-Ministerial Committee on Green Public Contracts***: It was established on 13.6.2017 in order to draft an Action Plan to promote Green Public Contracts and submit proposals for planning a national policy within eighteen (18) months of its operation onset. The National Action Plan is approved by a Joint Ministerial Decision of the Minister of Economy and Development and the Minister of Environment and Energy. There is a similar proposal, prepared by a previous committee, for 'greening' 18 product groups and a study-proposal for a National Action Plan;

(c) **A mixed inter-ministerial Working Group titled 'Industry Forum'**, established on 2.2.2016. The conclusions and proposals make an explicit reference-proposal in favour of promoting circular

economy in manufacturing through the 'circular economy' model, which guides industrial entrepreneurship towards new productive operation models strongly characterised by innovation, environmental conservation and rational use of energy resources;

(d) **A mixed inter-ministerial Working Group titled "Agri-nutrition, Manufacturing, Tourism"** (16.9.2016);

(e) **A mixed Group of ELOT** [Hellenic Standardisation Organisation] Experts on "The Environment and Circular Economy" to effectively use international standards and to develop national standards concerning the environment, waste and circular economy, monitoring-participating in International & European standardisation activities and recording domestic needs for models to help select standards of Greek interest (27.7.2017);

(f) **An inter-ministerial Group for the prevention of food waste and the creation of waste from food residues** (27.9.2017);

(g) **A partnership on Circular Economy** (EU Urban Agenda), with the participation of 6 major urban centres (Oslo, The Hague, Prato, Porto, Kaunas and Flanders), 4 states (Finland, Poland, Slovenia, Greece), the European Commission (DG REGIO, ENV, CLIMA, RTD, GROW, etc.) and some organisations (CEMR, EUROCITIES, URBACT and EIB); the aim are the policies of Circular Economy in Urban Centres. The Greek working team includes participants from the Ministries of Environment and Energy, Shipping and Insular Policy, Tourism, and the General Secretariat for Industry, under the coordination of the Ministry of Economy and Development (Special Service for Strategy, Planning and Evaluation – EYSSA).

The major sources of funding include the relevant Sectoral and Regional Operational Programmes, the Green Fund and the EU competitive programmes.

The relevant Sectoral Operational Programmes are grouped in two categories, namely Competitiveness, Entrepreneurship & Innovation, and Transport Infrastructure, Environment and Sustainable Development. Through a manual search in the Integrated Information System of the ESIF in the current programming period, 115 projects related to the CE (Thematic Objectives 4,6 and 7) have been funded with a budget of €1.5 billion until December 2019 (Table *3*). The overwhelming majority of these projects are improving waste management.

Table 3: Number of projects funded by Sectoral Operational Programmes in 2014-2020

Operational Porgram	**Number of projects**	**Total budget**
Competitiveness, Entrepreneurship and Innovation	1	11,750,000
Transport Infrastructure, Environment and Sustainable Development	114	1,511,915,967
Total	**115**	**1,523,665,967**

Using the same methodology for the Regional O.P.s in the same investment priorities, a total of 89 projects were identified absorbing approximately €256 million in 6 years (Table *4*). Again, the majority of these funds are earmarked for waste treatment.

Table 4: Number of projects funded by Regional Operational Programmes in 2014-2020

Region	**Nr**	**€**	**%**
Western Macedonia and Thrace	5	6,738,603	2.63
Attica	7	32,465,713	12.69
North Aegean	12	21,198,956	8.28
Western Greece	3	11,469,229	4.48
Western Macedonia	5	19,541,720	7.64
Epirus	12	68,666,395	26.83
Thessaly	6	21,362,330	8.35
Ionian Islands	3	3,189,799	1.25
Central Macedonia	1	49,600	0.02
Crete	35	71,212,199	27.83
Total	**89**	**255,894,544**	**100.00**

The Green Fund (2020) operates in parallel with the O.P. Environment and Sustainable Development. The Green Fund may finance programs drawn up by the Ministry of Environment and Energy or other Ministries and their supervised agencies, decentralised administrations, local authorities, legal entities of the wider public sector, as defined by Article 1 of Law 1256/1982, and associations or other associations of legal and natural persons, which, in accordance with their statutory purposes, aim at the protection, upgrading and restoration of the environment. The Green Fund has a broader mandate but can be involved in CE actions.

Lastly, the EU competitive programmes mentioned above (INTERREG, URBACT, H2020 etc.) can also support the funding of the CE implementation in Greece. An overview of the H2020 participations indicates that there are 83 Greek participations in bioenergy projects, 356 in biomass and 110 in various sustainability-related research projects, indicating high research skills.

The deficient implementation, divergent from the goals and the relative position of the country compared to the EU average may be attributed mainly to the following bottlenecks and path dependent, embedded deficiencies. In order to catch up the Ministry of Environment and Energy designed a too ambitious to be implemented programme, while ministries have been following their own policy agendas with regions and municipalities designing their policies following major EU and national guidelines but with limited inter-regional interaction.

The business sector is not sufficiently sensitised and involved[7]. This is attributed both to the overall problems faced by private investment in the country, in particular during the 10year long financial

[7] This is a generic statement, few success stories exist but are small scale for the time being.

crisis[8], but also to the complexities and long-term nature of profitability of investments in the areas of waste management, recycling and energy/materials efficiency. This has led to tensions between the private and the public sector and resistance to change. An additional issue undermining the profitability of aluminium and glass recycling is that Roma empty the recycle bins and steal the most valuable among streams diminishing the scale and profitability of private undertakings.

12.4.3 Governance

The interaction between the National Authorities, the Regional Authorities and the Municipal Authorities has developed with fragmented actions over the years and is rather complex (see Figure 1) and bureaucratic. The governance structure is determined at the central level by the Ministry of Environment, and Energy, which adopted the National Plan for Waste Management (NPWM), conceived with the aim of separating the different streams of waste in order to comply with the EU guidelines and respect the 2025 and 2030 targets.

Four main actors are involved, namely Organisations of Solid Waste Management, the National Organisation of Recycling, Systems of Alternative Management and few fragmented private or NGO initiatives for smaller streams, like coffee residuals etc., which are not thoroughly registered or documented:

[8] Greece ranks 79th in the World Bank list of Ease of Doing Business https://openknowledge.worldbank.org/bitstream/handle/10986/32436/9781464814402.pdf and 59th in the Global Competitiveness report http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf

- *The Organisations of Solid Waste Management (OSWM)* which are public or publicly owned (inter-municipal) limited liability companies. The most active among them are the ones from Western Macedonia and from Eastern Macedonia-Thrace, as well as the inter-municipal one from Heraklion Crete. Many OSWM face financial liquidity problems and are unable to cover their obligations. In an effort to rationalise the process Law 4555/2018 foresees the demolition of the existing OSWM and the creation of one per prefecture (Law-post, 2019). However, due to administrative and financial problems the re-organisation has not yet materialised.
- *The National Organisation of Recycling (EOAN)* is the responsible body of the Ministry of Environment and Energy for the design and implementation of policies for the prevention and alternative management of packaging and other products (EOAN, 2019). It is responsible for approving national alternative product management systems, as well as for monitoring Greece's progress in recycling. Central-collection facilities of Recyclable Materials. Such centres are not geographically bounded and there are interregional cooperation schemes for that.

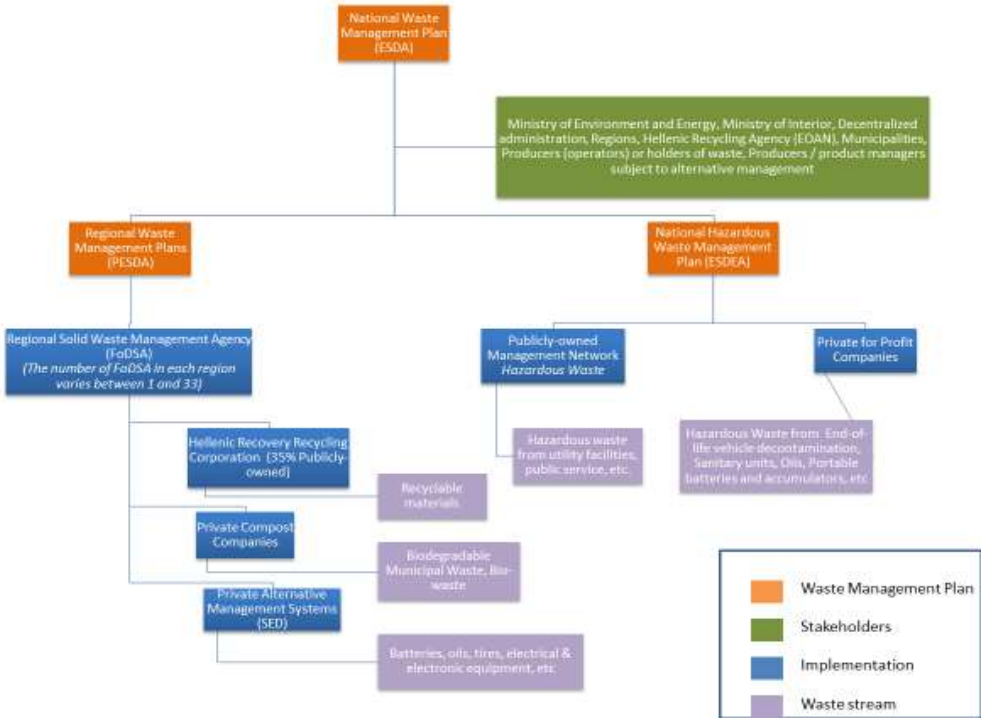

Figure 1 – Waste Management Organisations in Greece

- *Systems of Alternative Management (SED)*, which are private, profit-oriented, officially licensed enterprises collecting specific waste streams for recycling. Such Systems include

the large, generic Hellenic Recovery Recycling Corporation (HERRCO) collecting in the same blue bins the basic recyclable materials and smaller, specialised collection streams (batteries and accumulators, electrical and electronic equipment, packaging and packaging waste, end life cycle vehicles, excavation construction and demolition waste, used vehicle tires and lubricating oil waste) (HERRCO, 2019; EOAN,2019). State aid rules applied here in the past and have caused bureaucratic delays. These systems are now reluctant to nay governance changes, because the SED and the reorganisation of OSWM address the same market.

Funding is organised in a top down and bottom up mix: The Ministry, at the central level, has adopted its unrealistically ambitious National Programme for Waste Management (NPWM). All 332 municipalities of the country[9] had to come up with local waste management plans (LWMP), which would align with the ambitious targets of the NPWM. An indicative target set centrally was that 60% of bio-waste had to be forwarded for composting. This was unachievable within the time limits foreseen. Once the municipalities adopted their LWMP the corresponding (higher level administration) Regional Authorities[10] aggregated their suggestions into Regional Waste Management Plans (RWMP).

Figure 2presents an overview of the system based on the experience of the Programming Period 2014-2020. However, a major change occurred in 2019, with the introduction of the Circular Economy Strategy described below.

[9] Municipalities carry the responsibility for waste management in their territory.
[10] Regional Authorities carry responsibility for the implementation of the ESIF co-funded regional O.P.

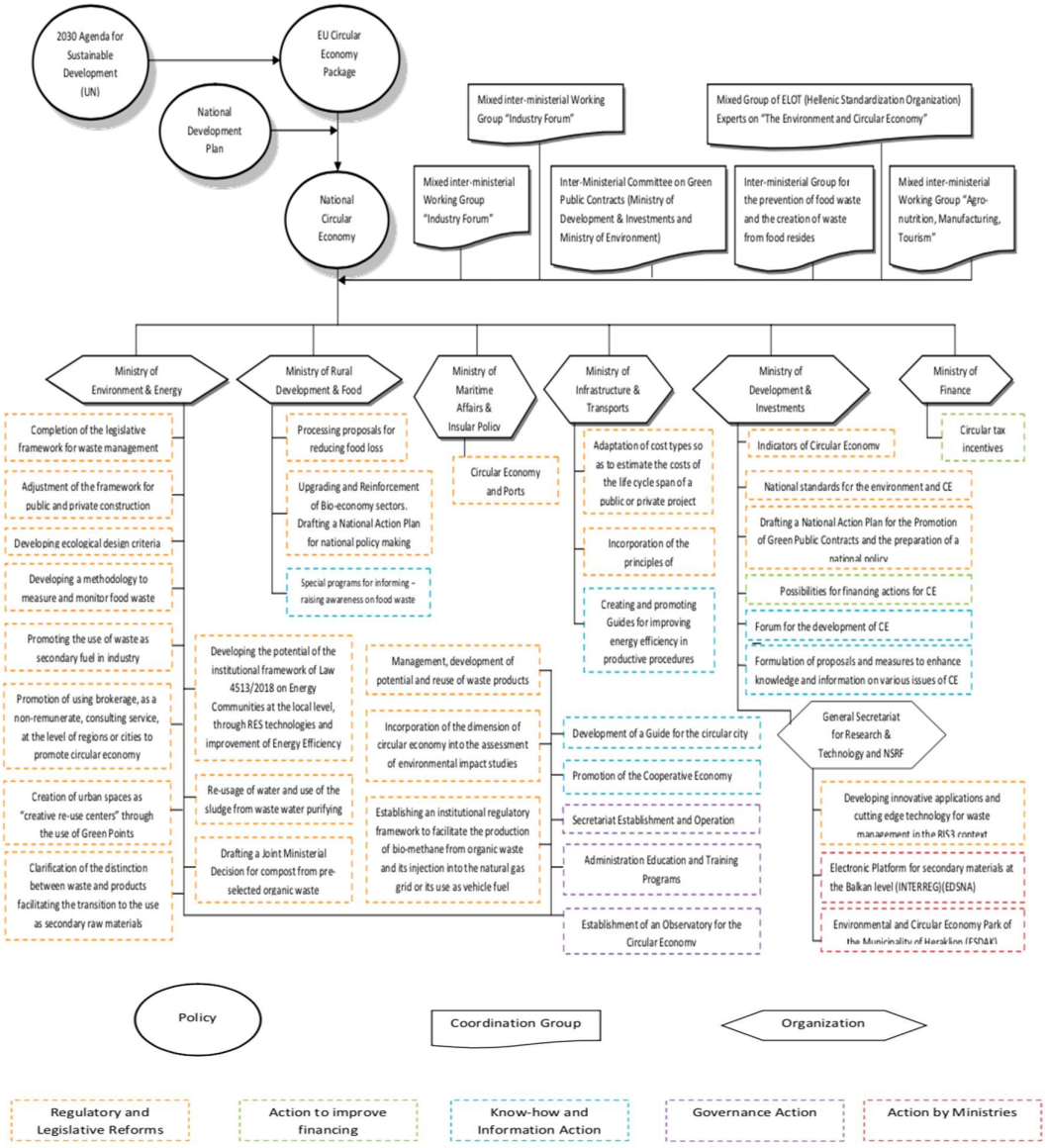

Figure 2: The broader governance set up directly or indirectly involved with the CE

12.4.4 **The Greek National CE Strategy (NCES)**

The Ministry of Environment and Energy is precipitating the CE transition recognising its potential value. Two Secretaries General are appointed, one with a mandate to coordinate waste management and one for the Natural Environment and Waters, carrying responsibility for the CE. A National Strategy for CE was adopted in December 2018, after stakeholder consultation in an effort to accelerate circular economy actions and unlock growth potential. The Strategy is composed of following eight long-term goals (2030).

I. Integrating the criteria for ecological design/planning and analysis of product life cycle, avoiding the introduction of hazardous substances into their production and facilitating reparability and extension of product life span. The use of non-hazardous substances also

improves the quality of waste during the process of production, thus also reducing environmental income.

II. Effective implementation of prioritisation of waste management, promoting the prevention of creating waste and encouraging re-usage and recycling.

III. Creating and promoting Manuals for improving energy efficiency in procedures of production.

IV. Promotion of innovative forms of consumptions, such as the use of services instead of purchasing products or the use of electronic computers and digital platforms.

V. Promotion of a rational consumption model, based on information transparency in regard to the features of goods and services, their life span and energy efficiency.

VI. Facilitation and creation of appropriate channels for the exchange of information and the coordination between administrations, the scientific community and the economic and social agencies, so as to lead to synergies compatible with the transition to the circular model.

VII. Highlighting the significance of shifting from linear to circular economy, by promoting transparency in procedures, improving information given to citizens, training and raising social awareness.

VIII. Processing transparent and feasible indices for monitoring the implementation of the transition.

The public policy on circular economy focuses on the financing tools, planning and enactment of a regulatory framework and rules, as well as removal of bureaucratic obstacles, connection of small and medium-sized entrepreneurship and social economy to technological innovation and the development and support of pilot/demonstration actions of circular economy and improvement of governance and networking, and acceleration of relevant procedures. (Ministry of Environment and Energy, 2018)

Besides the sectors listed above, the spectrum of actions of implementation could be further enhanced by launching a series of institutional interventions that will reinforce circular economy, modular planning and open innovations; setting priorities on the basis of economic, social, and environmental criteria; and defining indicators to assess the circular economy model; facilitating circular economy and industrial symbiosis entrepreneurial initiatives (administrative cost curtailing, public procurement premiums, eco-industrial parks, establishment of an appropriate regulatory framework and adjustment of the existing one). Smart financing tools with aids and tax-reliefs together with utilising public investments, the NSRF, the Investment Bank, the Juncker package and other Funds and resources could facilitate the implementation of the NCES.
Additionally, enacting open licences, promotion of open technologies, utilisation of open innovation products -particularly in academic institutions and public administration; establishing specifications; creating data bases and use of information for defining indicators to assess circular economy in various sectors; incentives for developing social entrepreneurship, synergies and social economy in sectors of resource and material reuse (eco-industrial clusters, patent pools); policies facilitating the establishment of 'smart factory' plants, which will be innovative, applying high technology, green, modular and, probably digitised; and a communicative strategy to raise citizens' awareness along with the provision of incentives.

Appendix 2 is presenting the Greek Action Plan of the Circular Economy gives a detailed timetable of the Actions expected to be implemented within 2019. The Operational Action Plan envisaged Regulatory and Legislative Reforms in a number of areas with a very optimistic attitude towards

early implementation. Legal amendments are necessary to allow/facilitate measures, and they can be preceded by preparatory activities. It is important to ensure that wherever there are no mandatory regulatory provisions, regions will be allowed to proceed with their actions without expecting the national authorities to come up with recommendations

Other areas requiring supporting actions include improving finance by investigating financing possibilities and circular tax incentives; know-how and Information; and governance actions. A forum for the development of circular economy, a development of a Guide for the circular city and promotion of the Sharing Economy; special programmes for informing - raising awareness on food waste, promoting guides for improving energy efficiency in productive procedures and the formulation of proposals and measures to enhance knowledge and information on various issues of circular economy are some of the methods to educate citizens on CE. Governance actions include the establishment and operation of a relevant Secretariat, Education and Training Programmes and the establishment of an Observatory for the Circular Economy.

The NCES is significantly delayed but is an excellent list of topics to be discussed as basic themes for a future implementation plan. While the NCES is a significant step for awareness raising at political, policy and society levels, it should be viewed only as a good starting point: at this stage it constitutes a pertinent shopping list but is characterised with more enthusiasm than reality checks. It praises the CE and neglects its challenges. The conviction that the CE is beneficial for competitiveness relies on assumptions and contexts (like long term investments, high profit margins and local manufacturing traditions), but neglects the significant bottlenecks of path-dependence and finance in the country. Lagging regions, suffering from persistently low private investments and limited bank liquidity tend to adopt short-term, survival solutions. Hence, a prerequisite for the NCES to succeed is a detailed context-specific analysis of cooperation, coordination and synergies to come up with solutions shifting from a short-termism behaviour to a realistic, profitable long-term strategy and the corresponding action plan.

12.5 The SSS experience

Since the mid' 80s the EU has adopted a cohesion policy whereby the less prosperous regions receive development aid from the European budget to make up for the uneven consequences of free trade following New Economic Geography and New Trade Theory insights. These transfers have been a major (occasionally, the only) funding source of development funding in Greece. The way policies were designed to absorb these funds has evolved over the years, as initially the funds were mainly spent on physical infrastructure and then gradually investments in a wider array of investment priorities to include technology, competitiveness and human capital.

In the programming period 2014-2020 the European Commission adopted for the first time the idea of Smart Specialisation Strategies as an ex ante conditionality for releasing the ESIF funds. Smart specialisation is an innovative approach that aims to boost growth and jobs in Europe, by enabling each region to identify and develop its own competitive advantages. Through its partnership and bottom-up approach, smart specialisation brings together local authorities, academia, business spheres and the civil society, working for the implementation of long-term growth strategies supported by EU funds (European Commission, 2019c).

Like all member States the Greek authorities have designed SSSs both at a national level and in the 13 Greek regions, to allow them for selecting their own priorities. Ideally the SSS would be the

rationale and background for the adoption of Sectoral and Regional O.P.s. However, because of institutional difficulties the adoption of the SSS was delayed and the O.P.s were adopted earlier, or in parallel, and adopted an extrapolating, path-dependent approach. Therefore, the SSS had a less decisive role than planned for. The Ministry and its sectoral O.P. had the primary role for the design, indicators and governance, leaving limited room for radical changes in case the SSSs had foreseen any.

The priorities selected by the regional SSS are presented on Table 5. The CE does not figure anywhere as the priorities are broader but clearly the agri-food sector and energy saving, being indirectly associated with the CE were part of practically all SSS, either as sectoral or as horizontal priorities. Within these priorities actions or projects adopting CE approaches could be included. SSS are rather broad and encompassing, the National SSS being the broadest and including eight sectors, practically reflecting the whole of the Greek economy.

Table 5: The Greek regional SSS priorities

	Priorities	**Horizontal**
Eastern Macedonia and Thrace	*Rural*, Manufacturing, Tourism (Culture), Emerging Technologies (Environment, Energy, Innovative Building Materials, Hybrid Technologies)	
Attica	Agri-food, Design-intensive sectors, Culture - Media, Tourism, Information & Communication Technologies, Environmental technology, Energy *(RES, energy saving*, smart grids), Drug / Health, Intelligent and Sustainable Transport, Shipbuilding	
North Aegean	*Agri-food sector development*, Tourism - *Nature* - Culture, Innovation mechanisms and instruments, Equal islands	
Western Greece	*Agricultural Production*, Aquaculture and Food, Tourism, Culture, Materials and Microelectronics	ICT, Energy
Western Macedonia	*Agri-food sector* with agri-livestock products, Tourism Sector, *Waste Management, Energy & RES Heating*, Fur Sector	
Epirus	Primary Sector, Manufacturing, *Agriculture,* Gastronomy, Industry Experience: Tourism, Culture and the Creative Economy, Information & Communication Technologies, Health and Wellness, Academic Institutions, and Youth Entrepreneurship	
Thessaly	Agri-Food, Creative Tourism, *Environment* Energy, Rehabilitation & Advanced Health Services, Metal & Building Materials	
Ionian Islands	Primary sector, *agri-food* and gastronomy, Maritime economy: Fisheries, aquaculture, marine tourism, Industry of experience: Tourism, culture and creative industry	
Central Macedonia	*Agri-food*, Tourism, Building Materials, Textiles & Clothing	ICT, Environment
Crete	*Agri-food complex*, Cultural-Tourist complex, *Environmental complex*, Knowledge complex	
South Aegean	*Agri-food*, Fisheries and aquaculture, Industry of experience, *Green energy saving technologies*	
Peloponnese	*Agri-food sector*, Tourism sector, Information & Communication Technologies, Manufacturing and other dynamic sectors (materials)	*Energy, Environment*, Transport
Central Greece	*Agri-food*, Experience industry, *Green innovation, RES energy saving and production*, Supporting the metal value chain	

12.6 Linking the Smart Specialisation Strategy to the CE Transition: a Greek pilot

After studying the CE transition progress and the SSS experiences in Greece we focused on the main target of this study, which was to investigate the potential mutual reinforcement and synergies between the two. The methodology used was to systematically explore each one of the 14 SSS and complement the search with the relevant Sectoral Operational Programmes[11] trying to assess the extent to which their content corresponds to which NSCE goals.

In the 2014-2020 programming period the crisis influenced the design of the Partnership Agreement with the EU towards favouring short-term projects with absorption targets and immediate, visible results inevitably neglecting longer term investments. Environmental protection and the CE suffered under this approach, as they are by definition front-loaded in funding, but profitability only follows later. The adoption of the SSS and the corresponding Sectoral and Regional Operational Programmes (O.P.s) could constitute an opportunity for Greece to embark into the CE transition with incentives for the business sector and knowledge-based investments.

[11] Because of the lags and differences between the late adopted SSS and the important role of the Sectoral O.P.s

Appendix 3 presents the results of the application of our methodology, namely the Type of Intervention and Description by regional SSS and two Sectoral O.P.s (OP-Competitiveness, Entrepreneurship, Innovation and OP-Transport Infrastructure, Environment and Sustainable Development) for all the cases we consider potentially relevant for the CE. No evidence of explicit reference to the CE was found in the O.P, for Agriculture). The outcome of this desk research was presented and discussed in the Workshop held on September 19th and validated by stakeholders.

While the methodology proved interesting, there are two caveats we need to draw attention to at this pilot phase. As pointed out earlier SSS were adopted late in Greece, usually after the initial activities of the corresponding O.P.s were designed. Hence, whatever is included in the SSS design was not ipso facto translated into budgetary provisions. In the future the SSS are expected to be closely linked, if not identical, with the O.P. and the methodology will prove more effective. In the current programming period, we focused on the SSS only, as this was the target of the study. Would we need a thorough study of the CE (unlinked to the SSS) we would need to differentiate between SSS and regional OPs. There are significant delays in the ESIF absorption and project implementation for most O.P.s and corresponding revisions. Consequently, CE actions suggested under the SSS may eventually not be implemented at all or at least not yet.

After extracting the relevant suggestions, we tried to match them to the individual goals of the CE. Appendix 4 presents the distribution of actions per region and NCES, leading to the following initial conclusions. Few activities suggested under the regional SSS address the CE directly. But many of the axes and interventions described per region and captured in Appendix 4, which are related to agricultural production, rationalisation of the economy, energy and the environment may (or may not) be implemented in compliance with the NCES approach and principles, even though they were initially not adopted as such. The number and type of axes, interventions and related goals vary significantly across regions both in qualitative and in quantitative terms. Appendix 4 shows the relative frequencies per region and type of intervention. The highest number of CE-related interventions were found in Central Macedonia, followed by Central Greece and the Peloponnese. The lowest in Western Greece and Western Macedonia.

The National SSS and Central Macedonia envisage interventions in all goals. The CE goals supported by the SSS are mainly goal 1 (Integrating the criteria for ecological design/planning and analysis of product life cycle), goal 2 (Effective implementation of prioritisation of waste management, promoting the prevention of creating waste and encouraging re-usage and recycling), goal 3 (Creating and promoting Manuals for improving energy efficiency in procedures of production) and goal 7 (Highlighting the significance of shifting from linear to circular economy) of the National Strategy for CE. In particular, all regions (except for North Aegean) envisage activities addressing goal 2, followed by goal 7, followed by goal 1 and goal 3. Conversely, the lowest number of goals addressed are goal 6 by 2 regions only (Facilitation and creation of appropriate channels for the exchange of information and the coordination), followed by goal 8, addressed by 3 regions (Processing transparent and feasible indices for monitoring the implementation of the transition).

12.7 A stakeholder Validation Workshop

A validation workshop on "Circular Economy Transition in Smart Specialization Strategy" was hosted by the Hellenic Ministry of Environment and Energy seeking the communication of the main outcomes of the project related to the synergies among the National Strategy on Circular

Economy (CE) and the Research and Innovation SSS; and the discussion on the implementation of these strategies identifying the needs, barriers and strengths in Greece. Key stakeholders (e.g. Ministers, Region officials, Town mayors, entrepreneurs and start-ups) composed the audience in this participatory workshop, sharing their views on how the challenges of CE should be overcome and the opportunities to be exploited.

During the first part of the workshop, EIT Climate-KIC experts exercised system innovation tools to policy makers and other participants aiming to form a picture of their views on CE integration to S3. The stakeholders provided their opinion regarding CE implementation in S3 in Greece. The main opportunities and challenges identified during this process are discussed below.

12.7.1 Opportunities

In the class of the opportunities emerging from the workshop, first comes the green growth of the Greek economy. An opportunity that can be achieved through several interventions including the implementation of CE in different aspects such as redefining the regulations on recovered wastewater and creating new possibilities for the use of treated water, increasing the wastewater use. The combination of a shift towards the growth of the primary sector, the strengthening of the IT market and the creation of specific IT brands will drive the above implementation goals, which in turn will generate more jobs.

There is a real growth scenario for Greece, where it is possible to demonstrate how an economic crisis can represent a moment of industrial transition to the circular economy. Cost deduction and sustainable consumption increase can be the right combination to overcome both economic and environmental critical issues. For example, an interaction between the agri-food and mining sectors could be created to reduce imports of raw materials and circularly manage existing mines. This would promote the creation of a new sector, that of agri-mining. Equally required is the need for the circular economy to be technologically dressed, i.e. the use of deep tech to improve decision making and the optimization of all procedures. Besides that, it is possible to make the shipping repair industry a conservation industry.

The development of the green economy will be possible thanks to greater synergy between governmental bodies and through a public-private partnership. Cohesion in terms of economic development should be increased and a differentiated approach to access to more sustainable resources, especially in the extractive industry, should be ensured. This is the only way to increase competitiveness at international level. Due to the different perceptions of the concepts and expectations for the implementation of the circular economy by the different stakeholders, it is of great importance to start now for the design of the new programming period an intensive discussion on the national concept for the implementation of circular economy issues in any term that can help the sustainable development of the country.

In the preparation of the next programming period, the opportunity to incorporate the circular economy into the sectoral priorities of the new SSS should be included as a specific priority. As far as the public sector is concerned, it is necessary to apply the best practices necessary to assess the appropriateness of CE; create synergies and educational programs; and show problems to citizens on the decision-making side.

12.7.2 Challenges

There are also many challenges to be faced. These include achieving the objectives of the Circular Economy, creating measures and standards for companies to obtain the label as a "service or product of the circular economy" and developing the private sector more sustainably. Among the most difficult challenges is the regulation on the exploitation limits of raw materials, a traditional and sensitive sector with low sensitivity to innovation and a rigid legislative and operational framework. More interlocutors need to be found in different ministries to design an integrated approach for CE and SSS and create new synergies between the national and regional levels. A new policy and financing framework, strong stakeholder engagement and SME commitment are also needed. A general change of mindset accompanied by a general change in consumer behaviour is essential to make policy implementation possible.

A different perception of doing business should be disseminated, as well as a systematic approach based on motivation and not punishment. Other practical challenges that have emerged related to supporting the shipping recycling industry and deep-tech (big data industries and blockchains) and limiting the phenomenon of greenwashes. Another theoretical challenge concerns the consumer economy, which implies the affirmation of the principle that to own is to be, thus pushing to maintain the ownership of values for individual things. In particular, it shows that the greatest problems in Western Greece and Attica are solid waste, recycling and sea plastic pollution.

12.8 Conclusions

This pilot EIT project are very timely for Greece, which at the moment is ready to adopt a revised SSS in view of the 2021-2027 programming period and needs to proceed with the revision of the adopted NCES.

The methodology proved operational and was positively received by the stakeholders involved in the validation workshop organised by the Ministry of Environment and Energy, despite some shortcomings deriving from the lack of experience and time constraints under which both the SSS and the NCES were designed in the past. In the new programming period, with the experience gained, the methodology coupling the two strategies can be mutually reinforcing and in particular help shift from a short to a longer-term needed horizon, which is crucial for the CE success. The involvement of profitable activities by the business sector is an integral element to be incorporated in this co-design effort.

The research identified a series of problems in the Greek case. NCES focused primarily on waste management until 2019 performing below EU average even in this one aspect of the CE. Past efforts to gain ground were too ambitious to be implemented and led to disillusionments. The finally adopted NCES is more a list of potential actions than a real, country-specific strategy. In an effort to sensitise stakeholders it praises the CE and neglects to warn about challenges. The ambitious Action Plan could not be implemented within the timeframe foreseen, while the governance is not based on synergies and private investments (a prerequisite for the NCES to succeed) and profitability are not sufficiently involved. Finally, the multi-level/multi-actor interaction between National, Regional, Municipal Authorities, the business sector and NGOs is rather complex, bureaucratic and interests are often conflicting not complementary.

These problems are not insurmountable, if resolved and linked to the SSS synergy opportunities can arise. Regional design based on competitive advantages can provide the long-term perspective and public-private cooperation the CE needs. Natural resources are available in the country and so are untapped secondary resources and waste. Using them as inputs for the revision of the SSS can lead to the generation of new competitive edges exploiting the scientific skills and expertise as well as productive tradition and know-how in technical trades. A primary sector with growth potential that requires modernisation and reduction of production costs. Agri-food is a priority in almost all SSS so it is important to link it to its CE dimension in terms of production, consumption and waste management. A similar aspect can be exploited in the case of renewable energies.

Good governance, the exploitation of all available funding opportunities including good practices for new tools will be necessary to catch up with the EU average and even leapfrog. Policy makers should devise a generally acceptable coordination structure with clear demarcations of competences to ensure smooth cooperation between all administrative levels and the business sector, while consider using new instruments, such as financial engineering and green or technology public procurement to enhance the role of business. Learning from the profitable CE investment in other countries and using EU peer learning opportunities in combination with pilots in Greek Regions could enhance further the implementation of CE in Greece. Pilot the more mature Greek Regions, which, as demonstrated by this exercise (Crete, Attica, Epirus in terms of R&D; Western Macedonia and Eastern Macedonia and Thrace in waste management) advance faster than others, so that the revised SSS in these regions could be used as pilots for the CE. Finally, the National Strategy for Circular Economy needs to be redesigned in order to be more implementation oriented. That is, include more explicit goals, set specific targets, propose a practical framework and create a roadmap to enhance cooperation between the different levels of public administration, as well as to develop synergies across the wider public and private and public sectors.

The revised SSS can be instrumental to help allocate more funds for projects promoting the Circular Economy in both national and regional level and by developing a modern strategy, which will incorporate the SDGs and EU Action Plan, address upcoming challenges, while it will also transform the production model to become more sustainable and competitive in the long-term. Using the cross-referencing methodology of SSS and CE strategy goals adapted for the needs and competitive advantages of each country proves a very helpful tool in this endeavour. This is the main lesson drawn from the Greek exercise.

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APPENDICES

Appendix 1: SDG related to the CE

Goal	Target	Indicator
2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture	2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality	2.4.1 Proportion of agricultural area under productive and sustainable agriculture
6. Ensure availability and sustainable management of water and sanitation for all	6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally	6.3.1 Proportion of wastewater safely treated 6.3.2 Proportion of bodies of water with good ambient water quality
	6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes	6.6.1 Change in the extent of water-related ecosystems over time
7. Ensure access to affordable, reliable, sustainable and modern energy for all	7.2 By 2030, increase substantially the share of renewable energy in the global energy mix	7.2.1 Renewable energy share in the total final energy consumption
	7.3 By 2030, double the global rate of improvement in energy efficiency	7.3.1 Energy intensity measured in terms of primary energy and GDP
8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	8.4 Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-Year Framework of Programmes on Sustainable Consumption and Production, with developed countries taking the lead	8.4.1 Material footprint, material footprint per capita, and material footprint per GDP 8.4.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP

Goal	Target	Indicator
9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	9.1 Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all	9.1.1 Proportion of the rural population who live within 2 km of an all-season road 9.1.2 Passenger and freight volumes, by mode of transport
	9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities	9.4.1 CO_2 emission per unit of value added
11. Make cities and human settlements inclusive, safe, resilient and sustainable	11. 6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management	11.6.1 Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities 11.6.2 Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)
	11.a Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning	11.a.1 Proportion of population living in cities that implement urban and regional development plans integrating population projections and resource needs, by size of city
	11.b By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015–2030, holistic disaster risk management at all levels	11.b.1 Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015–2030

Goal	Target	Indicator
12. Ensure sustainable consumption and production patterns	12.1 Implement the 10-year framework of programmes on sustainable consumption and production, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries	12.1.1 Number of countries with sustainable consumption and production (SCP) national action plans or SCP mainstreamed as a priority or a target into national policies
	12.2 By 2030, achieve the sustainable management and efficient use of natural resources	12.2.1 Material footprint, material footprint per capita, and material footprint per GDP 12.2.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP
	12.3 By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses	12.3.1 (a) Food loss index and (b) food waste index
	12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment	12.4.1 Number of parties to international multilateral environmental agreements on hazardous waste, and other chemicals that meet their commitments and obligations in transmitting information as required by each relevant agreement
	12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse	12.5.1 National recycling rate, tons of material recycled
	12.6 Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle	12.6.1 Number of companies publishing sustainability reports
	12.7 Promote public procurement practices that are sustainable, in accordance with national policies and priorities	12.7.1 Number of countries implementing sustainable public procurement policies and action plans

Goal	Target	Indicator
	12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature	12.8.1 Extent to which (i) global citizenship education and (ii) education for sustainable development (including climate change education) are mainstreamed in (*a*) national education policies; (*b*) curricula; (*c*) teacher education; and (*d*) student assessment
14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development	14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution	14.1.1 Index of coastal eutrophication and floating plastic debris density
	14.2 By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans	14.2.1 Proportion of national exclusive economic zones managed using ecosystem-based approaches
	14.3 Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels	14.3.1 Average marine acidity (pH) measured at agreed suite of representative sampling stations
	14.4 By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics	14.4.1 Proportion of fish stocks within biologically sustainable levels
	14.6 By 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported and unregulated fishing and refrain from introducing new such subsidies, recognizing that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the World Trade Organization fisheries subsidies negotiation	14.6.1 Degree of implementation of international instruments aiming to combat illegal, unreported and unregulated fishing
	14.a Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing	14.a.1 Proportion of total research budget allocated to research in the field of marine technology

Goal	Target	Indicator
	countries, in particular small island developing States and least developed countries	
15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements	15.1.1 Forest area as a proportion of total land area 15.1.2 Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type
	15.2 By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally	15.2.1 Progress towards sustainable forest management
	15.3 By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation- neutral world	15.3.1 Proportion of land that is degraded over total land area
	15.4 By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development	15.4.1 Coverage by protected areas of important sites for mountain biodiversity 15.4.2 Mountain Green Cover Index
	15.c Enhance global support for efforts to combat poaching and trafficking of protected species, including by increasing the capacity of local communities to pursue sustainable livelihood opportunities	15.c.1 Proportion of traded wildlife that was poached or illicitly trafficked
17. Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development	17.4 Assist developing countries in attaining long-term debt sustainability through coordinated policies aimed at fostering debt financing, debt relief and debt restructuring, as appropriate, and address the external debt of highly indebted poor countries to reduce debt distress	17.4.1 Debt service as a proportion of exports of goods and services
	17.7 Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed	17.7.1 Total amount of approved funding for developing countries to promote the development, transfer, dissemination and diffusion of environmentally sound technologies

Appendix 2: The Greek Action Plan of the CE

Description	Time of Implementation in 2019	Promoting - Coordinating Party
Waste management	1st half	Ministry of Environment and Energy (Ministry of the Interior-Ministry of Economy and Development)
Green Public Contracts, Greening 18 Product Groups	1st half	Ministry of Economy and Development (Ministry of Environment and Energy, Ministry of Infrastructure and Transport, Ministry of the Interior)
Proposals for reducing food loss	2nd half	Ministry of Agriculture and Food (Ministry of Environment and Energy)
Construction projects framework	2nd half	Ministry of Environment and Energy (Ministry of Infrastructure and Transport)
Distinction between waste and products facilitating the transition to the use as secondary raw materials	1st half	Ministry of Environment and Energy (Ministry of Economy and Development, Ministry of the Interior)
Re-usage of water and use of the sludge from wastewater purifying plants	2nd half	Ministry of Environment and Energy (Ministry of Economy and Development, Ministry of Agriculture and Food, Ministry of the Interior)
Developing innovative applications and cutting-edge technology for waste management in the RIS3 context	2nd half	General Secretariat for Research & Technology, Ministry of Economy and Development
Indicators of Circular Economy	1st half	Ministry of Economy and Development (Ministry of Environment and Energy, Ministry of the Interior)
Developing a methodology to measure and monitor food waste	1st half	Ministry of Environment and Energy (Ministry of Economy and Development, Ministry of the Interior)

Developing ecological design criteria	2nd half	Ministry of Environment and Energy (Ministry of Economy and Development, & ELOT [Hellenic Standardisation Organisation], Ministry of Infrastructure and Transport)
National standards for the environment and circular economy	2nd half	Ministry of Economy and Development (ELOT [Hellenic Standardisation Organisation], Ministry of Environment and Energy, Ministry of Infrastructure and Transport, Ministry of the Interior)
Incorporation of the dimension of circular economy into the assessment of environmental impact studies	1st half	The Ministry of Environment and Energy in cooperation with the competent Ministries at any given case: Ministry of Economy and Development (concerning entrepreneurial activities), Ministry of Infrastructure and Transport (concerning infrastructure), Ministry of the Interior (concerning licensing and municipal regulations).
Promotion of using brokerage, as a non-remunerated, consulting service, at the level of regions or cities to promote circular economy	2nd half	Ministry of Environment and Energy (Ministry of Economy and Development, Ministry of the Interior)
Creation of urban spaces as 'creative re-use centres'through the use of Green Points/KAEDISP [Centre for recycling, training and sorting at source], turning them into 'Green Centres'	1st half - 2nd half	Ministry of Environment and Energy (Ministry of the Interior)
Promoting the use of waste as secondary fuel in industry	1st half	Ministry of Environment and Energy (Ministry of Economy and Development, Ministry of the Interior)
Establishing an institutional regulatory framework to facilitate the production of bio-methane (green gas) from organic waste and its injection into the natural gas grid or its use as vehicle fuel	2nd half	Ministry of Environment and Energy (Ministry of the Interior

Drafting a Joint Ministerial Decision for compost from pre-selected organic waste	1st half	Ministry of Environment and Energy (Ministry of Economy and Development)
Upgrading and Reinforcement of Bio-economy sectors. Drafting a National Action Plan for national policy making	2nd half	Ministry of Agriculture and Food (Ministry of Environment and Energy)
Developing the potential of the institutional framework of Law 4513/2018 on Energy Communities at the local level, through RES technologies and improvement of Energy Efficiency	1st half	Ministry of Environment and Energy
Management, development of potential and reuse of waste products	2nd half	Ministry of Environment & Energy (Min. of Infrastructure & Transport)
Adaptation of cost types so as to estimate the costs of the life cycle span of a public or private project	2nd half	Ministry of Infrastructure and Transport
Incorporation of the principles of circular and sharing/cooperative economy in Sustainable Urban Mobility Plans (SVAK)	1st half	Ministry of Infrastructure and Transport (Ministry of Environment and Energy)
Circular Economy and Ports	2nd half	Ministry of Insularity and Island Policy (Ministry of Environment and Energy, Ministry of Infrastructure and Transport)

Appendix 3: OP and ROP interventions possibly linked to CE

Programme	Level	Type of Intervention	Description
OP-Competitiveness, Entrepreneurship, Innovation	National	Action	RESEARCH-CREATION-INNOVATION
OP-Competitiveness, Entrepreneurship, Innovation	National	Action	Enhancement of the Environmental Industry
OP-Competitiveness, Entrepreneurship, Innovation	National	Action	Green Point Network, Development of separate waste collection systems and composting
OP-Competitiveness, Entrepreneurship, Innovation	National	Action	Open Trade Centres
OP-Competitiveness, Entrepreneurship, Innovation	National	Fund	Infrastructure
OP-Transport Infrastructure, Environment and Sustainable Development	National	Priority Axis	Priority Axis (14): CONSERVATION AND PROTECTION OF THE ENVIRONMENT - PROMOTING EFFICIENT USE OF RESOURCES
OP-Transport Infrastructure, Environment and Sustainable Development	Regional - Attica	Call	Integration and completion of integrated waste management infrastructure.
OP-Transport Infrastructure, Environment and Sustainable Development	Regional - Crete	Call	"Integration and completion of integrated waste management infrastructure".
OP-Transport Infrastructure, Environment and Sustainable Development	Regional - Epirus	Call	"Integration and completion of integrated waste management infrastructure".
OP-Transport Infrastructure, Environment and Sustainable Development	Regional - Ionian Islands	Call	Integrated municipal solid waste management actions in islands and small remote settlements in Transition Regions
OP-Transport Infrastructure, Environment and Sustainable Development	Regional - North Aegean	Call	Integrated municipal solid waste management actions in islands and small remote settlements in Transition Regions
OP-Transport Infrastructure, Environment	Regional - Peloponnese	Call	"Integration and completion of integrated waste management infrastructure".

Programme	Level	Type of Intervention	Description
and Sustainable Development			
RIS	National	Action	Increase investment in existing companies to introduce new products and services to the market and to develop and implement modern production methods
RIS	National	Action	Support businesses to build and expand advanced capabilities to develop new products and services in new areas
RIS	National	Target	Assist enterprises in the research and development of technologies for the collection, sorting, separation and exploitation of products derived from recyclable materials
RIS	National	Target	Development of technologies for the recovery, recycling and reuse of materials, development of alternatives for the absorption and economic recovery of materials recovered from special waste streams.
RIS	National	Target	Development of innovative applications and cutting-edge technologies for the management of municipal waste (with a focus on bio-waste), industrial waste and special waste streams, such as agri-food waste and tires
RIS	National	Target	Produce high quality environmental services to society to enhance transparency and mitigate social reactions, facilitating business involvement in the study and conservation of environmental resources and biodiversity. In this context, research and development of innovations in natural disaster planning, tackling the effects of climate change, exploiting genetic information on biodiversity, improving access to environmental information, and involving businesses in conservation will be pursued. of ecosystems and biodiversity.
RIS	National	Target	An ecosystem-based approach to sustainable development through the creation of pilot research centres (e.g. upgrading laboratory equipment for the measurement of solid fuels, biofuels and secondary fuels from municipal waste), economic mapping of ecosystem services, etc.
RIS	Regional - Attica	Indicative actions	Products and processes for the management and exploitation of waste, trash and residues

Programme	Level	Type of Intervention	Description
RIS	Regional - Attica	Indicative actions	Trash and waste utilization
RIS	Regional - Attica	Indicative actions	Products and processes for the management and exploitation of trash, residues and waste
RIS	Regional - Attica	Indicative actions	Development of innovative products and processes for the management and exploitation of waste, trash and residues for energy production and high value-added products
RIS	Regional - Attica	Indicative actions	Management and exploitation of waste, trash and residues for energy production and high value-added products
RIS	Regional - Attica	Indicative actions	Technologies and methods for reducing environmental footprint
RIS	Regional - Central Greece	Action	Modernizing and applying sustainable farming methods
RIS	Regional - Central Greece	Action	Improvement of cover crops and introduction of hydroponics and aeroponic methods
RIS	Regional - Central Greece	Action	Certification, standardization and introduction of innovations in the processing of agricultural and livestock products
RIS	Regional - Central Greece	Action	Support for new innovative manufacturing companies
RIS	Regional - Central Greece	Action	Development and introduction of innovations for the modernization of farming methods and production protocols
RIS	Regional - Central Greece	Action	Use of green technologies in manufacturing and tourism
RIS	Regional - Central Greece	Action	Industrial coexistence program to exploit waste and reduce resource use
RIS	Regional - Central Greece	Action	Small-scale investments in energy production in production units and holdings
RIS	Regional - Central Greece	Action	Documentation of the potential of biomass utilization from various sources for energy production

Programme	Level	Type of Intervention	Description
RIS	Regional - Central Macedonia	Action	"Technological Development Projects to Improve Product Quality (Sustainability, Eco-Friendly)".
RIS	Regional - Central Macedonia	Action	"Synthesis of artificial marble using recyclable aggregates"
RIS	Regional - Central Macedonia	Action	"Manufacture of materials from renewable raw materials"
RIS	Regional - Central Macedonia	Action	"Water recycling in materials production processes"
RIS	Regional - Central Macedonia	Action	"Exploitation of by-product of fly ash from lignite combustion"
RIS	Regional - Central Macedonia	Action	"Utilization of by-products and by-products - feed enrichment (bio-active foods)"
RIS	Regional - Central Macedonia	Action	"Utilization of by-products and waste by biotechnological methods for the production of new products"
RIS	Regional - Central Macedonia	Action	"Knowledge platform in collaboration with operators and market"
RIS	Regional - Central Macedonia	Action	"Creation of permanent research - industry - consumer education & interconnection networks"
RIS	Regional - Central Macedonia	Priority	Reducing the Environmental Footprint of the Agri-Food Processes
RIS	Regional - Central Macedonia	Priority	Reduce Generation Costs with emphasis on Reducing Energy Consumption
RIS	Regional - Central Macedonia	Priority	Reducing the Environmental Impact of Construction Products and Reducing their Energy Footprint (carbon footprint)
RIS	Regional - Central Macedonia	Priority	Smart buildings
RIS	Regional - Central Macedonia	Priority	Reduce Generation Costs with emphasis on Reducing Energy Consumption (2)

Programme	Level	Type of Intervention	Description
RIS	Regional - Central Macedonia	Priority	Reducing Environmental Footprint - Saving Resources
RIS	Regional - Central Macedonia	Specific Strategy	Specific Strategy 2 (HS2) "Empowering human capital in the direction of innovation - knowledge based on market needs".
RIS	Regional - Central Macedonia	Specific Strategy	Specific Strategy 3 (HS3) "Emphasis on strategic areas of specialization, utilization of Key Enabling Technologies / KETs and development of extroversion strategy".
RIS	Regional - Central Macedonia	Supporting Strategy	"Strategies to support knowledge absorption and business dynamics". These include, inter alia, (a) lifelong learning activities in enterprises (high maturity), (b) awareness-raising of businesses and stakeholders about the benefits and prospects of innovation, entrepreneurship-enhancing actions (average maturity) and (c) supporting demand for innovation through actions such as innovation vouchers (low maturity).
RIS	Regional - Central Macedonia	Supporting Strategy	"Strategies to Support Recovery of Lost Soil in Regions with High Intensity in the Primary Sector." These include, inter alia, (a) regional offices for the promotion of entrepreneurship (high maturity) and (b) lifelong learning and skills development (high maturity).
RIS	Regional - Crete	Indicative Implementation Priorities	Precision agriculture in the country (climate and business organization of production)
RIS	Regional - Crete	Indicative Implementation Priorities	Utilization of agricultural waste products for the production of high nutritional value feed
RIS	Regional - Crete	Indicative Implementation Priorities	Develop protocols, reduce production costs and improve the quality of cheese products in Crete
RIS	Regional - Crete	Indicative Implementation Priorities	Improving efficiency (reducing energy consumption of water systems, irrigation, wastewater management, solid waste management and generally large infrastructure)
RIS	Regional - Crete	Indicative Implementation Priorities	Development of technological applications to reduce the environmental footprint of economic activities (hotels, industries, hospitals and other public buildings).

Programme	Level	Type of Intervention	Description
RIS	Regional - Crete	Indicative Implementation Priorities	Pilot program for the development and introduction of new technologies to reduce water losses
RIS	Regional - Crete	Indicative Implementation Priorities	Development of innovative municipal, industrial, livestock etc. solid waste management systems and pilot applications (prevention, collection, treatment, recovery / exploitation)
RIS	Regional - Crete	Indicative Implementation Priorities	Development of innovative municipal and / or industrial wastewater management systems and pilot applications (reuse, biofuel production, etc.)
RIS	Regional - Eastern Macedonia & Thrace	Action	Modernize the agri-food complex and improve regional added value by using technologically driven innovation.
RIS	Regional - Eastern Macedonia & Thrace	Action	Support for agri-food business investment plans for the introduction of RES technologies.
RIS	Regional - Eastern Macedonia & Thrace	Action	Support business investment plans for the introduction of RES technologies
RIS	Regional - Eastern Macedonia & Thrace	Priority of Intervention	Utilizing modern production technologies and systems to reduce inputs into the production process
RIS	Regional - Eastern Macedonia & Thrace	Priority of Intervention	Reduce the cost of production and disposal of products (including energy and transport).
RIS	Regional - Eastern Macedonia & Thrace	Priority of Intervention	Utilizing alternative uses of primary by-products, including their use as an energy resource.
RIS	Regional - Eastern Macedonia & Thrace	Priority of Intervention	Utilizing technologies to reduce the volume and toxicity of waste along the value chain of the agri-food complex and further reduce its environmental footprint.
RIS	Regional - Eastern Macedonia & Thrace	Priority of Intervention	Rational management and utilization of natural resources (water, agricultural land, forest wealth, pastures, etc.)

Programme	Level	Type of Intervention	Description
RIS	Regional - Epirus	Action	Development of applied research for food processing and by-product processing companies
RIS	Regional - Epirus	Action	Production of new innovative food products
RIS	Regional - Epirus	Action	Networking businesses that embody innovation
RIS	Regional - Epirus	Action	Improvement of existing farming methods
RIS	Regional - Epirus	Action	Utilizing local potential for fish production
RIS	Regional - Ionian Islands	Action	Production of agri-food products
RIS	Regional - Ionian Islands	Action	Use of green technologies in agricultural production
RIS	Regional - Ionian Islands	Action	Use of green technologies in the processing of agricultural products
RIS	Regional - Ionian Islands	Action	Development and use of green technologies in tourism
RIS	Regional - North Aegean	Project	3 pilot projects for waste management - treatment of waste mills - dairies - kernels for the purpose of creating new products
RIS	Regional - North Aegean	Project	3 pilot projects for the management of organic plant materials and waste for compost and / or pellet production
RIS	Regional - North Aegean	Project	Pilot project on green technology in accommodation or tourist service units
RIS	Regional - North Aegean	Action	Waste management
RIS	Regional - North Aegean	Action	Upgrading tourism offer-business networking
RIS	Regional - Peloponnese	Area for Intervention	Promoting Precision Agriculture

Programme	Level	Type of Intervention	Description
RIS	Regional - Peloponnese	Area for Intervention	New technologies to promote and record water savings for irrigation
RIS	Regional - Peloponnese	Area for Intervention	Developing innovative methods for the utilization of waste, by-products and residues to reduce energy consumption & compost production (in collaboration with research institutes in the country)
RIS	Regional - Peloponnese	Axis	Development of tourism in harmony with the environment
RIS	Regional - Peloponnese	Specific Target	Reducing Environmental Footprint, Adaptation to Climate Change in the Agri-Food Sector
RIS	Regional - South Aegean	Action	Modernizing and applying sustainable farming methods
RIS	Regional - South Aegean	Action	Improvement of cover crops
RIS	Regional - South Aegean	Action	Introducing innovations in the processing of fish and aquaculture products
RIS	Regional - South Aegean	Action	Use of green technologies in agricultural production. processing and tourism
RIS	Regional - South Aegean	Action	Small-scale investments in energy production in production units and holdings
RIS	Regional - Thessaly	Area for Intervention	Use of modern production technologies and systems to reduce inputs into the production process.
RIS	Regional - Thessaly	Area for Intervention	Reduce the cost of production and disposal of products (including energy and transport)
RIS	Regional - Thessaly	Area for Intervention	Utilizing alternative uses of primary sector by-products, including their use as an energy resource.
RIS	Regional - Thessaly	Area for Intervention	Implementation of innovative tools in the agri-food chain to reduce the volume and toxicity of their waste and further reduce their environmental footprint.
RIS	Regional - Thessaly	Area for Intervention	Reduce thermal energy costs by redesigning / modernizing energy-efficient thermal processes and utilizing biomass or waste, while

Programme	Level	Type of Intervention	Description
			reducing the environmental footprint of the plants.
RIS	Regional - Thessaly	Specific Target	Support existing and new businesses to exploit patents and / or innovations, as well as support services to improve their productivity and / or to develop new products and services.
RIS	Regional - Western Greece	Indicative actions	Development of innovative technologies for the protection and ecological restoration of water bodies (rivers, lakes, wetlands) in tourist areas and areas important for fisheries and aquaculture etc.
RIS	Regional - Western Greece	Indicative actions	Development of materials recovery, recycling and reuse technologies
RIS	Regional - Western Greece	Indicative actions	Development of innovative applications and cutting-edge technologies for the management of bio-waste and industrial waste and their energy utilization especially in the agri-food sector.
RIS	Regional - Western Macedonia	Indicative actions	Localized district heating systems with biomass utilization
RIS	Regional - Western Macedonia	Indicative actions	Pilot waste refinery unit to optimize material sorting and align with the principles of industrial coexistence.
RIS	Regional - Western Macedonia	Indicative actions	Development of Cluster Bioenergy and Environment (CLUBE) activities in Western Macedonia
RIS	Regional - Western Macedonia	Indicative actions	Exploitation of western Macedonia's marine mining and quarrying by-products for the production of innovative / high value-added environmentally friendly materials.
RIS	Regional - Western Macedonia	Indicative actions	Upgrade and expansion of biological cleaning (sludge compost management and safe disposal projects) of the Macedonian MABIK Meat Industry of Western Macedonia
RIS/EAFRD	Regional - Peloponnese	Action	Development of standard pasture management methods
RIS/EAFRD	Regional - Peloponnese	Action	Design-Installation-operation of standard forage parks
RIS/EAFRD	Regional - Peloponnese	Action	Utilization of by-products of Dairies, Olive Mills with pilot application in demonstration units

Appendix 4: CE-related actions per region and NCES goals

Number of Interventions per Region (5 in brackets)

	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8	No of Interven-tions
Attica		6	2				6		7
Central Greece	3	4	2	1	1		4	2	9
Central Macedonia	8	9	4	2	2	2	2	1	20
Crete	1	5	3	1	1		3	1	9
Eastern Macedo-nia and Thrace	3	2	4				7		8
Epirus	2	2				1	3		6
Ionian Islands		2					4		5
North Aegean		4		3	3				6
Peloponnese	3	6	1				3		9
South Aegean	1	1	1				3		5
Thessaly	3	4	2				2		6
Western Greece	1	3	1	1	1		2		3
Western Macedonia		4	2				2		5
National RIS	7	3	2	3	1	1	1	1	7
National total	32	55	24	11	9	4	42	5	105

Share of Goal per region (%)

	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8	No of Interven-tions
Attica		11%	8%				14%		7%
Central Greece	9%	7%	8%	9%	11%		10%	40%	9%
Central Macedonia	25%	16%	17%	18%	22%	50%	5%	20%	19%
Crete	3%	9%	13%	9%	11%		7%	20%	9%
Eastern Macedonia and Thrace	9%	4%	17%				17%		8%
Epirus	6%	4%				25%	7%		6%
Ionian Islands		4%					10%		5%

North Aegean		7%		27%	33%				6%
Peloponnese	9%	11%	4%				7%		9%
South Aegean	3%	2%	4%				7%		5%
Thessaly	9%	7%	8%				5%		6%
Western Greece	3%	5%	4%	9%	11%		5%		3%
Western Macedonia		7%	8%				5%		5%
National RIS	22%	5%	8%	27%	11%	25%	2%	20%	7%
National total	100%	100%	100%	100%	100%	100%	100%	100%	100%

Goals per Region (%)

	Goal 1	**Goal 2**	**Goal 3**	**Goal 4**	**Goal 5**	**Goal 6**	**Goal 7**	**Goal 8**	**Total**
Attica		43%	14%				43%		100%
Central Greece	18%	24%	12%	6%	6%		24%	12%	100%
Central Macedonia	27%	30%	13%	7%	7%	7%	7%	3%	100%
Crete	7%	33%	20%	7%	7%		20%	7%	100%
Eastern Macedonia and Thrace	19%	13%	25%				44%		100%
Epirus	25%	25%				13%	38%		100%
Ionian Islands		33%					67%		100%
North Aegean		40%		30%	30%				100%
Peloponnese	23%	46%	8%				23%		100%
South Aegean	17%	17%	17%				50%		100%
Thessaly	27%	36%	18%				18%		100%
Western Greece	11%	33%	11%	11%	11%		22%		100%
Western Macedonia		50%	25%				25%		100%
National RIS	37%	16%	11%	16%	5%	5%	5%	5%	100%
National total	18%	30%	13%	6%	5%	2%	23%	3%	100%