

RIS3 Regional Assessment: Central Greece

A report to the European Commission, Directorate General for Regional Policy, Unit I3 - Greece & Cyprus

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1. Executive summary: Overall conclusions and recommendations

Smart specialisation and the regional innovation system

Stereia Ellada is a largely mountainous region that has become a manufacturing hotspot due to the development of industrial zones in the southern Voiotia province bordering Athens. The manufacturing activities have generated economic spillovers but also important environmental problems (generally near the national transport networks), especially for water and soil resources. In terms of industrial specialisation, the region is relatively specialised, compared to other European regions, in the manufacture of vegetables and animal oils and fats, the manufacture of tubes, mining of non-ferrous metal ores and the manufacture of cement, lime and plaster.

The expert team considers that there is a need to better integrate and support a more balanced development of the economy through a search for cross-sectoral opportunities for applying key enabling technologies, notably energy saving and ICT. We **recommend**, therefore, a focus on the agro-food industry as a key business sector with potential for greater synergies with the primary sector (agriculture) and service sector (tourism) as well as on the application of environmental and energy saving and ICT technologies in existing businesses

The regional innovation system is very weak but rather than invest in duplicating research or innovation infrastructures, the expert team **recommend** that due to the proximity to Attiki and (to a lesser extent) to Thessaly, efforts should aim at improving the access of regional firms to know-how and expertise located in neighbouring regions, while reinforcing or developing a small number of regionally based R&D and technology teams aligned with regional technological needs.

Recommendations on governance

The most significant challenge of the Region of Stereia Ellada is the establishment and strengthening of mechanisms for collaboration with R&I stakeholders. This can be achieved through various actions:

- Focus on the development of competences of the regional authorities for RDTI policies through a permanent collaboration with national (e.g. GSRT) and other regional authorities (IMAs from other regions) with experience, but also through the training of personnel, studying success stories etc.
- Engage stakeholders in a systematic and long-term participation, not only during the design of the strategy. This requires building permanent relationships with regional stakeholders, help them better understand the RIS3 concepts, create awareness on the regional weaknesses and improve their competence to formulate clear strategic objectives.
- Encourage and facilitate innovation collaboration between regional actors through the establishment of intermediary institutions and/or technology transfer mechanisms and schemes such as innovation poles, clusters and platforms.
- Develop closer collaboration with selected stakeholders from the private sector and the University in the framework of a regional innovation council.

Stereia Ellada region should develop a vision that turns the proximity to Attica into advantage, by investing in capacity building and strategic collaborations with selected institutions and organisations from the neighbouring regions that are specialised in technological fields relevant to the region's productive needs.

Recommendations on innovation policy

The 2007-2014 Regional Operational Programme (ROP) of Stereia Ellada has three main thematic priorities: (1) Infrastructure and services of accessibility, (2) Digital convergence and entrepreneurship, and (3) Sustainable development and quality of life. The total public expenditure allocated to Stereia Ellada was €525m. The Digital Convergence and Entrepreneurship priority received more than one third of the total ROP funding. This priority included RDT support and the exploitation of research results including the establishment of a regional innovation pole, the creation of start-

ups, spin-offs and spin-outs, the creation of clusters and business incubators. However, few such actions have been implemented in reality.

We **recommend** a design of innovation policy taking into account the uneven development and dualism between manufacturing, agricultural, and island areas of the Region. Different types of development (strong manufacturing complex in Viotia; island development in Euboea and Skyros; agriculture, livestock and forestry in Fthiotida and Erytrania) require different types of innovation policy.

The technology focus of smart specialisation should create opportunities for diversification and discovery of niche markets in manufacturing, local agricultural products, and the valorisation of natural resources (bauxite, thermal springs, mountainous regions). Most of technology inputs for these domains should be offered in collaboration to technology and specialised services providers located in Attica. The region should avoid duplication and creation of non-sustainable technology centres.

Innovation support actions to be included in the smart specialisation strategy should take the form of “Innovation Platforms” that provide a framework (legal, organisational, natural resources, physical facilities, digital, funding, etc.) that can sustain a large number of innovation initiatives. Platforms should be selected with respect to criteria of sustainability after the funding period; creation of capabilities; integrated solutions to technology-production-market-funding; private leverage; number of potential beneficiaries; and contribution to development goals. Viability will be higher if combined with PPPs and private funding and operation.

Recommendations on clusters

As Sterea Ellada lacks previous experience on **cluster policies** and has no mature clusters operating in the region, it is **recommended** to replicate a competitive technology industrial cluster approach to facilitate the rapid spread of good practice (e.g. Corallia Clusters Initiative). It is **recommended** that a particular focus should be given to strengthening the cooperation of existing/emerging sectors/clusters to make **connections to local, national and global value chains**. In this respect and due to the fact that the Region has borders and interconnections with Attica and Thessaly it should consider, incentives for the development of trans-regional clusters. The region should consider the creation of a **cluster secretariat** with the neighbouring regions

Recommendations on ICT policy – broadband – e-services

In addition to covering the referred topics of the RIS3 strategy regarding ICT, the Region should put special emphasis in the technological ICT support of crucial sectors of the regional economy i.e. agriculture, food & beverages, tourism, transportation, and health services.

The Region should investigate viable policy tools to provide incentives for new IT-enhanced products and services from local enterprises, and also award funds for the fast transformation of traditional businesses using ICT tools.

Broadband expansion (both wireline and wireless) is crucial for increasing the competitiveness and improving the quality of life in the less populated areas.

Special attention should be given to improving the ICT skills level of the citizens, and keeping the talented ICT professionals and attracting new ICT businesses, by creating new and sustainable demand for innovative ICT services. The coverage of citizens living in isolated areas is another important task of the Region that can be partly fulfilled by the deployment of reliable telemedicine and home-care services.

Particular emphasis should be placed in setting proper rules for the substantial involvement of the private sector of ICT, by assuming part of the risk for the planned investments.

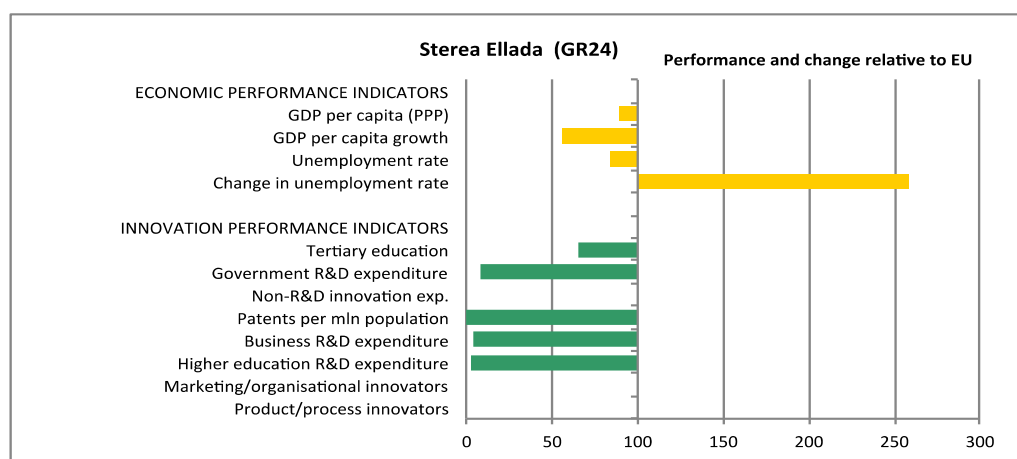
2. Regional Innovation Performance and potential

2.1 Regional profile and specialisation

Stereia Ellada (Central Greece) is the second largest Greek region with 554,609 people in a territory of 15,549 km² (2011, 4.9% of the Greek population)¹. Rich in mineral resources, the region is an important agricultural zone, but tourism and services are underdeveloped. This largely mountainous region has become a manufacturing hotspot due to the development of industrial zones in the southern Voiotia province bordering Athens. The manufacturing activities have generated economic spillovers but also important environmental problems (generally near the national transport networks), especially for water and soil resources (ADE, 2011).

The gross domestic product (GDP) per capita was €20,500 in 2009 (87% of the EU27 average), ranking the region 3rd in Greece (4.5% of national GDP). The industry and construction sectors accounted for 38.2% of the regional added value in 2009 (28.2% for manufacturing) whereas the service sector represented 55.1% and the agricultural sector 6.72% (see Appendix E). However, a major share of GDP “leaks” to nearby Athens, which is home to many workers and company headquarters. ADE (2011) underline that the main regional challenges are both geographical, because of its diversity; and economic, since the industrial presence in the south of the region masks the under-development of other areas, especially the mountainous Evrytania and Fokida provinces which suffer from emigration.

Figure 1 Summary benchmark of regional innovation performance



Source: Regional Innovation Monitor, data used is 2011 or latest available year. Trend data is over latest three year period for which data is available.

The crisis afflicting Greece has not spared Stereia Ellada: reduced demand, increased taxation and production costs have resulted in several years of losses for many firms (RIM, 2012). As a result, unemployment increased from 10.5% in 2008 to 18.9% in 2011. The education level is relatively low: only 17.3% (up from 8.8% in 2002) of the population aged 25-64 have completed tertiary education (25.4% in Greece, 26.8% in EU27), ranking the region third to last nationally. Worryingly, only 1.2% of adults aged 25-64 participated in life-long learning courses in 2011 (Greece: 2.4%, EU27: 8.9%).

According to the Regional Innovation Monitor (2012), the abundant mineral resources have boosted the development of a large number of companies in the manufacture of basic metals and fabricated metal products. The Voiotia prefecture hosts some of the largest production units in the country in manufacturing sectors such as electrical machinery, basic metals, non-metallic mineral products, rubber and plastic and products of wood and cork. In the rest of the region non-market services, commerce

¹ All data provided is sourced from Eurostat unless stated differently.

and tourism are the most important activities. Tourism and financial services are also among the fastest growing service activities in the region. The transport sector is also important for the region's development, owing to its position and its relatively high export intensity. The structure of the regional economy has a negative impact on energy demand and consumption, creating significant environmental problems related mainly to waste management and by-products of the manufacturing sector, and to a lesser extent to the primary sector. A recent development is an increased investment in renewable energy sources (mainly wind but also solar energy).

In terms of the regional innovation performance, the European Regional Innovation Scoreboard² ranks Sterea Ellada (part of the mega-region Kentriki Ellada) as a modest-medium innovator (the lowest of four performance categories) along with all other Greek regions, except Attiki. Similarly, the 2011 Regional Innovation Monitor report placed Sterea Ellada in a group of 19 knowledge absorbing innovating regions (again along with all other Greek regions, except Attiki). This group has the highest average score on 'innovative entrepreneurship' (the share of SMEs that have introduced innovations) but the lowest score on technological innovation, while non-R&D innovation expenditures (as a % of turnover) are higher than in any other group. This implies that innovation occurs mostly through integrating knowledge created elsewhere by purchasing 'off-the-shelf' technologies.

Indeed, despite significant manufacturing activity, Sterea Ellada performs poorly in terms of research and development (R&D) and innovation activities. In 2005, the gross expenditure on R&D (GERD) was only 0.18% of regional GDP (Greece 0.6%, EU27 1.83%). However, in contrast to most Greek regions, the business sector accounts for 42.7% of GERD (Greece 31%, EU27 63%). However, since 2008, the reduced private sector liquidity has most probably negatively impacted business R&D investments. Given that the University of Central Greece was only created in 2003, the higher education sector accounted for only 8.2% of GERD (47.5% in Greece, 22.5% in EU27) or €1.63m in absolute terms; whereas the government sector invested 11.4% of regional R&D (20.3% in Greece, 13.6% in EU27).

The share of Human Resources in Science and Technology (HRST) has slowly improved from 9% of the regional workforce³ in 2000 to 15.6% in 2011 (Greece: 32.4%), but the region still ranks second to last and has only 3.3 % of Greek HRST. There were 489 full-time equivalent (FTE) R&D personnel in 2005, or 0.2% of the regional active population (Greece, 0.69%; EU27 0.95%): 248 were in the business, 48 in the higher education and 20 in the government sector. Looking specifically at the share of researchers (0.1% of active population against 0.4% in Greece and 0.59% in EU27), 189 FTE researchers were working in a business, 25 were in the higher education and nine in the government sector.

In terms of industrial specialisation, the region is relatively specialised, compared to other European regions⁴, in the manufacture of vegetables and animal oils and fats, the manufacture of tubes, mining of non-ferrous metal ores and the manufacture of cement, lime and plaster. Indeed, eight of the 10 main industries in which the region is specialised are manufacturing industries (see Appendix F). Given the very low level of regional R&D activity, it is impossible to identify fields of scientific specialisation. The University of Central Greece has a very low scientific output⁵ with 43 publications from 2006-10 (0.1% of the total for Greek universities) of which only 9% involved an international collaboration (the lowest rate in Greece). During the same period the University ranked second last with 96 citations and given the low level of scientific

² MERIT & Technopolis 2012, http://ec.europa.eu/enterprise/policies/innovation/files/ris-2012_en.pdf

³ This indicator gives the percentage of the total labour force in the age group 15-74, that is classified as HRST, i.e. having either successfully completed an education at the third level or is employed in an occupation where such an education is normally required.

⁴ The minimum degree of specialisation is 1.5 (meaning that the region has 50% more employment in the industry than the size of the region), and the industry must have at least 500 employees in the region (in order to eliminate high specialisations in very narrow industries).

⁵ <http://metrics.ekt.gr/en/report02/index>

activity, it is impossible to calculate the citation impact⁶ or the main fields of science. The Technical Education Institute of Chalkida (TEI Chalkida) ranks 9th out of 16 Greek TEI both in terms of publications (98, i.e. 4.3% of total TEI publications) and in terms of citations (188) from 2006-10. The TEI Chalkida’s citation impact is rather low at 0.55 and it is active mainly in natural sciences and engineering and technology.

Figure 2 : SWOT of regional innovation potential and specialisation

Strengths	Weaknesses
<ul style="list-style-type: none"> • Proximity of Greek capital city • Strong manufacturing sector • Presence of a university • Natural and renewable energy resources 	<ul style="list-style-type: none"> • Dependence on Attiki region • Strong sub-regional disparities • Specialisation in low tech activities • Low level of investments in R&D • Low level of regional research institutions • Low level of ICT diffusion • Low level of life-long learning • Lack of innovation culture within firms
Opportunities	Threats
<ul style="list-style-type: none"> • Modernisation of the agro-food sector and linkages with other sectors along the value chain • Promotion of environmental and energy saving technologies • Improved support to upgrading SMEs technological capacity • Explore synergies with other regions in terms of innovation infrastructure and technology transfer • Increased focus on tourism promotion 	<ul style="list-style-type: none"> • Environmental deprivation • Competition from low-cost economies • Further decline of agricultural sector

In summary, Nioras (2012) identifies two main challenges for the regional economy:

- *Challenge 1: Modernise the agro-food sector and link it with other sectors along the value chain* Agriculture and the food industry are important sectors for the regional economy, accounting for a considerable share of its value added, but the two sectors are only partially linked. Moreover, only a small fraction of regional agro-food firms are innovative or perform R&D activities. This is gradually eroding the competitiveness of the sector and firms find it difficult to penetrate new markets, at a time when national demand is declining due to the crisis.
- *Challenge 2: Promote environmental and energy saving technologies.* A major regional challenge is environmental degradation. Environmental and energy saving technologies would have an impact on a wide range of industries, from manufacturing to services and tourism. Such technologies are applicable for firms in existing value chains and there is an opportunity to develop common infrastructures and investments.

The expert team considers that these two challenges are indeed critical for the region but that there is also a need to better integrate and support a more balanced development of the economy through a search for cross-sectoral opportunities for applying other key enabling technologies, notably ICT. We **recommend**, therefore, a focus on the agro-food industry as a key business sector with potential for greater synergies with the primary sector (agriculture) and service sector (tourism) as well as on the application of environmental and energy saving and ICT technologies in existing businesses

2.2 The strengths and weaknesses of the regional innovation system

The region possesses a weak public infrastructure for research and innovation, with no intermediary organisations (see Appendix C). The significant gap to the EU27 and

⁶ The relative number of citations to publications of a university compared to the world average

national average in terms of R&D investments is partly as the outcome of the limited demand from the industry, reflecting the low-to-medium technology structure and low export intensity of the economy, but also as a consequence of a very limited number of public research institutes and higher education institutes active in the region. Moreover, only a limited number of higher education and public researchers are active in technological sectors relevant to the regional business base.

However, as Nioras (2012) highlights, given the region's proximity to Athens, the absence of public R&D infrastructure cannot be considered as the main determinant of the limited business R&D activities of regional enterprises. Rather, the firms are not able to access effective intermediary organisations that can support their innovation activities and stimulate an endogenous growth model.

Hence, the expert team **recommend** that due to the proximity to the region of Attiki and (to a lesser extent) to Thessaly, efforts should aim at improving the access of regional firms to know-how and expertise located in neighbouring regions, while reinforcing or developing a small number of regionally based R&D and technology teams aligned with regional technological needs. This could be done by creating a regional technology network with a central co-ordinator providing training of a network of experts located in both regional and extra-regional organisations

3. Stakeholder involvement and governance of research and innovation policies

3.1 Stakeholder involvement in strategy design and implementation

As noted above, Sterea Ellada is faced by significant contradictions; it is one the most developed Greek regions with a high concentration of manufacturing, yet, this productive base is essentially integrated with Athens. Despite past efforts to develop regional innovation strategies (RIS, RIS+, RISE), the region still has a weak innovation system, a lack of intermediary organisations to support business innovation and a small share of specialised human resources. Its proximity to Attica has deterred the development of endogenous technological capabilities (RIM, 2012).

Previous R&I strategies and measures have mainly focused on the reinforcement of research infrastructure through the establishment of a University of Sterea Ellada and the creation of technology transfer and research collaboration through measures under the 3rd Community Support Framework. However, these projects were not sufficient to set in motion an endogenous innovation-led growth.

Figure 3 Priorities of RIS and RIS+ initiatives

RIS	RIS+
<ul style="list-style-type: none"> • Raise awareness among local entrepreneurs, concerning issues related to innovation and technology management • Encourage support organisations, whether based in the region or not, to take a pro-active approach to work with "traditional" non-innovative SMEs • Investigate the possibilities of intra and interregional co-operation between local organisations and firms <p>Selected pilot projects for further feasibility study</p> <ul style="list-style-type: none"> • Establishment of an innovative University of Sterea Ellada focusing on innovation management, technology transfer and small scales firm development; • Broadening and diffusion of databases which will be used as an Observatory; • Implementation of actions in the sector of cultural tourism. 	<p>Activities related to RTDI</p> <ul style="list-style-type: none"> • Improvement of organizational and technological capabilities of regional SMEs, • Pilot development and testing of an entrepreneurial web site • Promotion and creation of laboratories and model facilities. <p>A number of the activities proposed in the RIS+ were funded by the 3rd CSF, such as the creation of a University for Sterea Ellada, the adoption of raining schemes on innovation management techniques.</p>

In the 2007-13 period, the design and implementation of RDTI policies was highly centralised. However, for the new programming period the regional authorities intend to fulfil their role, in line with the Kallikratis reform, and elaborate a place-based development strategy. A weakness to overcome is that the elected regional authority

and the IMA have little previous experience in the design of R&I policies and in monitoring and assessment of such programmes. The bottom-up strategy design could be also jeopardised by the abilities/capacities of local stakeholders. During the meeting with organised by IMA on the 18th October, stakeholders expressed their willingness in participating to the formulation of the new strategy. However, discussion revealed different levels of maturity and experience in collaboration, and the ability to translate a vision into practical actions.

Hence, Sterea Ellada will need to address a dual challenge in the next programming period: the regional authority should reinforce its capacity for designing and implementing a smart specialisation strategy, and at the same time coordinate the stakeholders' participation and contribution to the development of the strategy. So far, the regional authority has taken significant steps towards this objective. The IMA has created a platform and hosts an online forum on its website for the facilitation of public consultation. Additionally, in order to engage participation and to integrate the opinion of local stakeholders it has distributed questionnaires for the definition of strategic priorities for 2014-2020. Given that the regional authority is aware of its limited know-how, it has foreseen to commit funds from the current OP 2007-2013 technical support for the design of the new strategy. A call for the selection of consultant has been published.

In the meeting with the stakeholders on the 18th October, the IMA described the lengthy and bureaucratic procedures, which currently exists, which could hinder and affect the effectiveness of any new strategy. It was stated that the region should now focus on a limited number of strategic areas, try to stimulate the interest of the private sector, and create programme and initiatives with consistency in time and true dedication.

The most significant challenge for Sterea Ellada is the establishment and strengthening of mechanisms for collaboration with R&I stakeholders. Accordingly the expert team make the following recommendations for actions:

- Focus on the development of competences of the regional authorities for RDTI policies through a permanent collaboration with national (e.g. GSRT) and other regional authorities (IMAs from other regions) with experience, but also through the training of personnel, studying success stories etc.
- Engage stakeholders in a long term participation (not only during the design of the strategy) and in a systematic way. Develop permanent relationships with regional stakeholders, help them better understand the concepts of RIS3, create awareness on the regional weaknesses and improve their competences in formulating clear strategic objectives.
- Encourage and facilitate collaboration in innovation among regional actors through the establishment of intermediary institutions and/or technology transfer mechanisms and schemes e.g. innovation poles, clusters, innovation platforms.
- Develop closer collaboration with selected stakeholders from the private sector and the University in the framework of a regional innovation council.

3.2 Multi-level governance and synergies between policies and funds

To date, the priorities described in the ROPs were merely a reflection of national priorities at a regional level. The concession of jurisdictions for RDTI policies to the GSRT has reduced cooperation at inter-regional and regional-national levels. For the new period, relationship with the GSRT would be welcome only on a consultancy base, as well as for the facilitation of developing synergies with other regions.

The expert team **recommend** that the region should develop synergies with neighbouring regions that share the same productive characteristics. Serious consideration should be given to collaboration with Thessaly on issues related to manufacturing, given the common Association of Industries for Thessaly and Sterea Ellada. Equally, the proximity to Attica should be seen as an advantage for developing RTDI collaboration with institutions and organisations located in Athens. Technology needs of manufacturing companies located in Viotia will be covered mainly by

technology providers located in Athens. Such collaboration, however, should never endanger the planning jurisdictions ceded to the regional authority of Sterea Ellada.

3.3 Vision for the Region

The development vision for Sterea Ellada in the Operational Programme 2007-13 was:

‘to be able to respond to the threats and seize the opportunities which appear, to emend weaknesses and enforce its potentialities. For this vision the region should achieve high levels of competitiveness, strengthen its export base, improve the skills of its human resources and restrain developmental dualism, develop intra-regional cooperative links and restrain at minimum its dependency on the economy of Attica’

(OP Stereas Ellada 2007-2013, pp. 147).

The dependency of most dynamic businesses of the region from Attica is seen as a threat. However, it is also an opportunity for developing locally specialised services, subcontracting, and producer relationships that these companies acquire from Attica. The Sterea Ellada region should develop a vision turning the proximity to Attica into an advantage, by investing in capacity building and strategic collaborations with selected institutions and organisations that are specialised in technological fields relevant to the region’s productive needs.

4. Towards a regional smart specialisation strategy

4.1 The regional research and innovation policy

The 2007-2013 Operational Programme for Sterea Ellada, as in other Greek regions, is composed of three main thematic priorities: (1) Infrastructure and services of accessibility, (2) Digital convergence and entrepreneurship, and (2) Sustainable development and quality of life, plus technical assistance. The total public budget allocated to Sterea Ellada was €525m (or 40,2% of the OP Thessaly-Sterea Ellada-Epirus) slightly higher than in the previous programming period (€508.6m).

Figure 4 ROP Sterea Ellada 2007-2013 – budget per priority

Priority axis	Total funding EU + national	%
1. Accessibility to Infrastructures and services	102.226.000	19,47
2. Digital convergence and entrepreneurship	200.099.800	38,11
3. Sustainable development and quality of life	212.362.000	40,45
4. Technical assistance	10.312.200	1,96
TOTAL	525.000.000	100

Figure 4 presents the budget by priority and Figure 5 summarises the objectives of the digital convergence and entrepreneurship priority, which was awarded more than a third of the total funding available. In terms of implementation, according to the IMA, the ‘Digital Convergence and Entrepreneurship’ priority has already committed 97% of the available funds (<http://www.stereaellada.gr/index.php?id=35>).

Figure 5 Current regional R&I priorities

Policy Documents	Digital Convergence and Entrepreneurship for Sterea Ellada
<p>Operational Programme of Thessaly, Sterea Ellada, Epirus 2007-2013, Athens 2007</p> <p>Επιχειρησιακό Πρόγραμμα Περιφέρειας Θεσσαλίας, Στερεάς Ελλάδας, Ηπείρου, 2007-2013, Αθήνα 2007</p>	<p>This priority axis aims at</p> <ul style="list-style-type: none"> • The promotion of R&I and their incorporation in the productive sector as a permanent motive for development and competitiveness; • The establishment of abilities for better integrating technologies and the creation of a system for the promotion of innovation which adapts produced innovations to local needs and conducts sufficient R&D, covering the gap compared to the national average; • The achievement of higher competitiveness through the re-organisation of the production base and the upgrading of sectors and branches towards higher added value, quality and environmental sensibility, • The strengthening of exports the successful deal with challenges coming from the expansion of the European economic area and the incessant deliberation of economic relations etc. <p>The priority funds business plans for productive investments, including</p>

	enterprise networking; business angels and mentoring; RTD support and the exploitation of research results; modernisation of the tourism sector; development of digital services for enterprises.
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However, the funding available for research innovation projects was centralised via the national sectoral OP ‘Competitiveness and Entrepreneurship’ managed by the GSRT. By September 2012, the budget for approved research and innovation projects in the region was only €10.8m (4.57% of the national total) of which 87% was awarded to companies and 13% to academic and public research organisations.

Although a first outline regional strategy has been produced, in response to the Ministry of Development’s guidelines, the priorities for the forthcoming 2014-2020 period for research, innovation, digital convergence and SME support are not yet clearly set. Hence, the expert team **recommends** that:

- The regional innovation policy should be tailored to the uneven, dual economy: a strong manufacturing complex in Viotia; insular economies on Euboea and Skyros; agriculture, livestock and forestry in Fthiotida and Erytania.
- The technology focus of smart specialisation should create opportunities for diversification and discovery of niche markets in manufacturing, local agricultural products, and the valorisation of natural resources (bauxite, thermal springs, mountainous regions). Most of technology inputs for these domains should be offered in collaboration to technology and specialised services providers located in Attica. The region should avoid duplicating non-sustainable technology centres.
- Innovation support should be delivered via ‘innovation platforms’ combining various types of actions (legal, organisational, natural resources, facilities, digital, funding, etc.) that enable a large number of business innovation initiatives to be realised. The selection criteria should be: financial sustainability (with an emphasis on public-private partnerships and leverage of private funding); capability creation; integrated solutions to technology-production-market-funding; number of potential beneficiaries; and contribution to overall development goals.

4.2 Cluster and entrepreneurship policies

According to the Cluster Observatory star rating system, the sectors in Sterea Ellada with the highest combined scores in terms of size⁷, specialisation⁸ and focus⁹ are Agricultural Products, Farming and animal husbandry (2 stars) and Processed food, Maritime, Construction (1 star). The region hosts neither a three star nor a mature cluster¹⁰. However, there are several organic clusters (see Box 1) which provide a basis for implementing cluster policies or for the deployment of cross-cluster measures.

⁷ The 'size' measure shows whether a cluster is in the top 10% of all clusters in Europe within the same cluster category in terms of the number of employees. If employment reaches a sufficient share of total European employment, it is more likely that meaningful economic effects of clusters will be present. Those in the top 10% receive one star.

⁸ The 'specialisation' measure compares the proportion of employment in a cluster category in a region over the total employment in the same region, to the proportion of total European employment in that cluster category over total European employment. If a region is more specialised in a specific cluster category than the overall economy across all regions, this is likely to be an indication that the economic effects of the regional cluster have been strong enough to attract related economic activity from other regions to this location, and that spill-overs and linkages will be stronger. If a cluster category in a region has a specialisation quotient of 2 or more it receives a star. If a cluster category in a region has a specialisation quotient of 2 or more it receives a star.

⁹ The 'focus' measure shows the extent to which the regional economy is focused upon the industries comprising the cluster category. This measure relates employment in the cluster to total employment in the region. If a cluster accounts for a larger share of a region's overall employment, it is more likely that spill-over effects and linkages will actually occur instead of being drowned in the economic interaction of other parts of the regional economy. The top 10% of clusters which account for the largest proportion of their region's total employment receive a star.

¹⁰ A mature cluster needs 1. specialised theme; 2. a good number of entities, especially enterprises; and 3. (most important) structured cooperation amongst the cluster entities. An emerging cluster only meets 1 or 2 of the above conditions.

Box 1: Mature and Emerging Clusters in Central Greece

Mature Clusters:

None. The following entities in the Region are, however, members of the mature microelectronics-based systems and applications cluster (mi-Cluster, www.mi-Cluster.gr): Department of Computer Science and Biomedical Informatics of the University of Central Greece, TEI of Halkida.

Emerging Clusters:

Manufacture of food products and beverages (manufacture of vegetable and animal oils and fats, manufacture of grain mill products, starches and starch products, manufacture of various food products), *Manufacture of Basic Metals* (manufacture of tubes), *Mining of Metal Ores* (mining of non-ferrous metal ores), *Manufacture of other non-metallic mineral products* (manufacture of cement, lime and plaster, manufacture of articles of concrete, plaster and cement), *Manufacture of chemicals and chemical products* (manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations), *Manufacture of Basic Metals* (manufacture of basic precious and non-ferrous metals), *Farming & Animal Husbandry* (fishing, fish farming and related service activities, farming of animals), *Construction and Construction Materials* (site preparation), *Agriculture* (growing of crops; market gardening; horticulture), *Transport* (sea and coastal water transport), *Manufacture of fabricated metal products* (manufacture of structural metal products), *Manufacture of wood and of products of wood and cork* (manufacture of builders' carpentry and joinery), Paper Products, Pharmaceuticals.

The Sterea Ellada region does not have previous experience of implementing **cluster policies**, nor does the first 2014-20 strategy document make any reference to clusters as a tool for regional development. The 2014-20 strategy document does refer, however, to the need for specialisation and actions it will take towards the development of specific sectors and, in particular: the “existence of large processing units in the Region”, “the remarkable natural and cultural reserve for the development of all forms of tourism”, “the large plains with of high productivity”, “the strategic location of marine areas”, “the significant number of young farmers that are familiar with the technology and new farming methods”, “the modern and competitive facilities in aquaculture and fishery“, “the existence products with designation of origin”, “the further development of mining as an opportunity”, “the existence of large companies with specialised R & D departments”, etc.

Hence, it is **recommended** to replicate a competitive technology industrial cluster approach to facilitate the rapid spread of good practice (e.g. Corallia Clusters Initiative). Moreover, qualitative studies applying **value chain analysis** should be carried out in the domains where the region shows relative specialisation to identify niche. An analysis of the linkages between clusters/ industries/sectors should be made to examine the potential for **cross-clustering** and the identification of innovation opportunities at the interface between different clusters (e.g. incorporate ICT in priority sectors to increase competitiveness). Specific funding measures and support should be developed aimed at primary and secondary sector innovation and inter-linkages among agriculture, farming, food processing and tourism (for the primary sector to produce differentiated products and for the secondary to connect the primary sector with tourism).

A particular focus should be given to strengthening the cooperation of existing/emerging sectors/clusters to make **connections to local, national and global value chains**. In this respect and due to the fact that the Region has borders and interconnections with Attica and Thessaly it should consider, incentives for the development of trans-regional clusters. The region should consider the creation of a **cluster secretariat** with the neighbouring regions.

In Sterea Ellada during the 2007-13 programming period a few state aid projects aiming to underpin research, innovation and entrepreneurship have been called, but overall, despite efforts to improve research and innovation through the creation of research structures, the collaboration of universities and research centres with businesses is extremely limited. Furthermore, due to the financial crisis many SMEs will not be in position to complete their investments plans. Only a few projects were implemented in the areas of technology transfer, improvement of cooperation networks between small businesses (SMEs), assistance for research and technological development, in particular for SMEs and support services for firms and groups of firms. The demand for such programmes was very low. Entrepreneurial and innovation support services (like one-stop-shops) have been promoted by various organisations in the Region notably through Structural Fund projects. However, despite the efforts of such intermediaries, collaboration between the small number of

innovation actors remains limited. It is recommended to create a **one-stop-shop** within existing structures or a new structure for potential investors/SME start-ups with the appropriate improvements and sustainability plans based on lessons learnt and known deficiencies of current implementations.

As can be seen from Appendix C, three industrial zones exist in the region but an incubator has not been established to date. The zones, which offer mainly real estate services and are not sector-specific, are referred to in the 2014-20 strategy draft as an opportunity where “highly qualified companies should be supported”. Furthermore, it is mentioned that “entrepreneurship will be promoted, by facilitating the economic exploitation of new ideas and fostering the creation of new companies, through entrepreneurship incubators (business incubators)”. The expert team **recommends** that incentives for the establishment of an **incubator** should be combined with other policies like clusters to focus support on the hosting and growth of priority sectors.

Furthermore, neither regional business angel networks nor regional venture capital funds exist nor are they considered in the Region’s proposal for 2014-20. A regional cooperative bank operates, but its impact cannot be assessed. It is **recommended** to support, probably in partnership with neighbouring regions (Attica and Thessaly) to ensure a minimum necessary deal flow, the creation of a **business angel network** and/or a co-investment fund.

4.3 Digital economy and ICT policies

Demand for ICT products and services in the Region of Central Greece is anemic, due to low income, and the lack of “digital” skills in a large portion of the citizens. This is reflected in all the relevant statistical data; according to the “Internet Users in Greece” survey (March 2010)¹¹ of the Observatory for Digital Greece¹², the PC usage and the use of the Internet was measured at around 36.5%, one of the lowest among the Greek Regions and far below the EU average.

The most notable ICT projects that have been implemented in the recent years were concerned with the implementation of metropolitan access optical networks (MAN) and municipal wireless hot-spots, tourism-related applications, the development of content for the disabled, digitising of cultural archives, natural disaster management system, and the networking of the higher education institutions and the school units to the national research and education network and the Internet.

A limited number of very small ICT enterprises are present in the Region, focusing on system integration, maintenance, and software support for state agencies and for the other local enterprises. The Region also hosts one University and one Technological Institute, with some ICT-related Departments.

The Region suffers from considerable drain of talented ICT professionals, as the relevant jobs are limited, due to the limited demand of ICT products and services. The young ICT graduates of the local higher education institutions are normally moving to other regions, thus creating additional challenges to any ICT revival effort.

According to the preliminary strategic directions of the Region¹³, the following sectors are best suited to benefit from modern ICT tools and technologies:

Agriculture and animal husbandry: represents a significant portion of the regional economic activity, with sizable growth potential, if combined with modern ICT tools. The Region could focus on distinct agricultural products that exhibit proven demand from international markets. The related business units should be encouraged to become more efficient by accommodating modern control, administration, monitoring, marketing, and logistics tools. Added value bio-agricultural and

¹¹ Ταυτότητα χρηστών internet στην Ελλάδα”, Παρατηρητήριο για την ΚτΠ, Μάρτιος 2010. http://www.observatory.gr/files/meletes/A100526_%CE%A0%CF%81%CE%BF%CF%86%CE%AF%CE%BB%20%CF%87%CF%81%CE%B7%CF%83%CF%84%CF%8E%CE%BD%20internet%202010.pdf

¹² See: <http://www.observatory.gr>

¹³ “Πρόταση Κατευθύνσεων 5ης Προγραμματικής Περιόδου”, Περιφέρεια Στερεάς Ελλάδας, Νοέμβριος 2012.

alternative agriculture producers can benefit from internet-based marketplace participation, to widen their distribution channels and optimise branding, procurement, packaging etc. Farmers and livestock unit owners could also be supported to optimise their production activity, by employing modern control and monitoring tools, especially in reducing the cost of energy by using renewable sources and other alternative methods, like geothermal resources or biogas.

Food & Beverages: the regional SMEs in this sector have a sizable growth advantage, due to the physical proximity with the huge markets of Attica. They may improve their profit margins and boost their sales by better branding and advertising, using new-generation ERP and CRM tools, along with modern e-commerce and procurement platforms.

Tourism: the Region has numerous areas of unique natural beauty, and several underexploited archaeological and religious sites, capable of attracting a significant number of high-profile visitors. SMEs should be motivated to exploit modern technology and synergies to maximize the outreach of the Region, minimise management and advertising costs, and thus create more and better jobs.

Transportation: the cost of transportation for citizens and businesses of the Region is enormous. Modern smart transportation approaches should be deployed, to minimise the cost of travelling, reduce the consumption of fossil fuels, and improve the efficiency of remote business units.

E-government and learning: the low level of IT skills in the Region implies that the cost of dealing with the regional public services is enormous for both citizens and regional and national government. Properly designed and interoperable e-government apps would be a major contribution towards efficiency and transparency. These services could be easily combined with proper initial training applications, to overcome the barriers of low IT skills.

Health: health services are beyond reach for several citizens living in remote or isolated mountainous locations. This problem can be partially solved by using new telemedicine or home-care services. The Region should provide support to the private sector, to deploy affordable telemedicine or home-care platforms, for selected classes of citizens. These services would be provided as public-private partnerships (PPPs), in cooperation with local state hospitals and health centres, under a proper sustainability model.

Broadband Internet: the availability of affordable broadband connections for all the households is a major European target. The Region should complement all the related national- and EU-level actions, to further extend broadband in the Region. More specifically, it should help making local Industrial Zones/Parks as “FttH-ready”, i.e. bringing fiber connectivity to each hosted enterprise. It is also crucial to facilitate additional actions like setting-up of public free-access hot-spots in public places, in ports, schools, sports/recreation areas, churches, etc. The Region should also investigate ways to improve the utilisation of existing MANs, and also provide proper incentives for the fast expansion of next generation cellular networks (e.g. LTE) in the Region.

Furthermore, the Region may prepare a versatile mechanism, tailored for its particular size and needs, for the substantial involvement of the private sector in the full cycle of regional project execution and risk sharing. This can be better carried out by flexible PPPs, or by the establishment of targeted ICT Vouchers for selected households or SMEs.

Regarding other specific RIS3 Strategy ICT-related requirements:

- There is currently no detailed regional ICT strategy per sector. In many cases, there may be a balanced allocation, in order to achieve better economies of scale.
- There is no master plan for e-government services. Most of them (cadastre, e-prescription, e-invoicing, etc) are administered by national authorities and, therefore, should be better addressed by a balanced allocation. Other possible e-services, like local taxation or regional permits, would be administered by the

Region. All e-government services should adhere to well-defined interoperability standards, and be based on dependable cloud computing platforms¹⁴.

- There is no reference to viable plans for the deployment of new, and the extension of existing NGA networks.
- The Region has also to prepare the creation of an operational inventory for ICT infrastructure.
- Active involvement of the private sector in ICT activities has to be addressed by the Region, in a way to both leverage community funding and improve sustainability, especially for the delivery of products and services.

5. Monitoring and evaluation

The capabilities for monitoring, evaluation and analysis of innovation programmes and performance should be further solidified and embedded in both the new regional government structures and the wider partnership. A specific budget line could be set aside for a partnership based regional innovation observatory that could fund studies and doctoral/post-graduate research into innovation practice in regional firms, etc.

Guidance on evaluation methodologies for innovation measures is already available for the 2014-20 period¹⁵ and the IMA, regional authorities, etc, should make themselves aware of and use such materials to develop an evaluation plan. At a minimum, one official should be specifically tasked with setting up an evaluation and monitoring system for innovation measures in the IMA.

¹⁴ http://ec.europa.eu/information_society/activities/cloudcomputing/docs/com/com_cloud.pdf

¹⁵ See: <http://bit.ly/Igzx5T>

Appendix A List of people attending regional workshop

Separate file

Appendix B List of key documents and reference materials

ΕΣΠΑ (2007) Επιχειρησιακό Πρόγραμμα Θεσσαλίας, Στερεάς Ελλάδος και Ηπείρου 2007-2013 (Operational Programme of Thessaly, Sterea Ellada, Epirus 2007-2013), Athens.

EC, DG Regional Policy (2002) ‘Regional Innovation Strategies under the European Regional Development Fund Innovative Actions 2000-2002 http://ec.europa.eu/regional_policy/archive/innovation/pdf/guide_ris_final.pdf

Υπουργείο Ανάπτυξης, Ανταγωνιστικότητας και Ναυτιλίας (2012) 1η Εγκύκλιος Σχεδιασμού και Κατάρτισης Αναπτυξιακού Προγραμματισμού 2014-2020 (1st Directive for Setting the Development Programme 2014-2020)

ΓΓΕΤ (2012) Πρόταση ΓΓΕΤ για τη Διαμόρφωση Κατευθύνσεων Αναπτυξιακής Στρατηγικής 2014-2020 (Proposal of GSRT for Defining Directions of Development Strategy 2014-2020)

Region of Sterea Ellada (2012) Διαμόρφωση των κατευθύνσεων εθνικής αναπτυξιακής στρατηγικής προγραμματικής περιόδου 2014-2020 (Formulation of guidelines for national development strategy of the programming period 2014-2020).

Logotech (2012) Regional Innovation Monitor: Regional Innovation Report (Sterea Ellada)

Region of Sterea Ellada (2002) Regional Innovation Strategy of Sterea Ellada, online, http://ec.europa.eu/regional_policy/archive/innovation/innovating/pdf/sterea-ellada_en.pdf

MERIT, Technopolis (2012), Regional Innovation Scoreboard 2012, Report for the European Commission, DG Enterprise and Industry, available here: http://ec.europa.eu/enterprise/policies/innovation/files/ris-2012_en.pdf

Regional Innovation Monitor (2012), <http://www.rim-europa.eu/index.cfm?q=p.baseline&r=GR24>

Eurostat data accessed on 5th December 2012, <http://epp.eurostat.ec.europa.eu>

ADE (2011), Study on the relevance and the effectiveness of ERDF and Cohesion Fund support to Regions with Specific Geographical Features – Islands, Mountainous and Sparsely Populated areas, Second Intermediate Report for the European Commission, June 2011

Nioras A. (2012), Regional Innovation Report (Sterea Ellada), within the project Regional Innovation Monitor, European Commission, Enterprise and Industry Directorate-General, Directorate D – Industrial Innovation and Mobility Industries

Appendix C Key Actors in the regional innovation system

Leading Businesses:

Metka, Aluminium of Greece, Titan, Hellenic Aerospace Industry, Alumax, Mobile Composting, Interklima, 2EN, Galenica, Interchem, S&B, Mante Bros., Ebetam,

Chromochimiki, Dias, infoMETRICS, ICE-Ioannou, Technika Plastika, Siamidis, Papadopoulou, Agatsas, (more to be added).

Key Research Actors:

The research fabric is mainly composed of the University of Central Greece, the Technological Educational Institute of Lamia and the Technological Educational Institute of Halkida.

Financing:

Cooperative Bank of Evia.

Incubators, Industrial Areas/Zones/Parks

Industrial Zone of Amfissa, Industrial Zone of Lamia, Industrial Zone of Halkida.

Principal Intermediaries:

Development Agency of Central Greece and Thessaly, Boeotia, Euboea, Phocis, Parnassos, Phthiotis, Evrytania, Chamber of Commerce and Industry of Boeotia, Euboea, Evrytania, Phocis, Phthiotis, Industrial Association of Central Greece, Technical Chamber (chapter of East Central Greece, Chapter of Euboea), Hoteliers Association of Arahova, Euboea, Kammena Vourla, Karpenisi, Loutra Edipsou, Loutra Ypatis, Halkida, Investors Receptions Centers of Boeotia, Euboea, Evrytania, Phocis, Phthiotis, etc.

Appendix D Regional RTDI funding under the OP Competitiveness and Innovation

Allocation by region of GSRT grants for RTDI projects (State Aid) under the OP Competitiveness and Innovation

Region	Enterprises	Research organisations	Other entities	Grand Total	% share
Attiki	€ 78,383,203	€ 33,291,462	€ 480,411	€ 112,155,076	47.4%
Central Macedonia	€ 22,588,727	€ 13,566,039	€ 38,300	€ 36,193,066	15.2%
Western Greece	€ 22,841,816	€ 8,901,221	€ 7,000	€ 31,750,037	13.4%
Crete	€ 3,623,524	€ 13,728,214	€ -	€ 17,351,738	7.2%
Stereia Ellada	€ 9,388,903	€ 1,397,119	€ -	€ 10,786,022	4.6%
East Macedonia & Thrace	€ 5,886,928	€ 1,864,884	€ 25,090	€ 7,776,902	3.3%
Thessaly	€ 4,648,471	€ 2,134,643	€ 253,000	€ 7,036,114	3.0%
Epirus	€ 2,403,100	€ 1,887,252	€ -	€ 4,290,352	1.8%
Peloponnese	€ 3,382,986	€ 545,200	€ -	€ 3,928,186	1.7%
Βορείου Αργαίου	€ 1,813,280	€ 425,506	€ -	€ 2,238,786	0.9%
West Macedonia	€ 1,355,665	€ 524,695	€ -	€ 1,880,360	0.8%
Ionian Islands	€ 388,000	€ 120,000	€ -	€ 508,000	0.2%
Νοτίου Αργαίου	€ 476,000	€ -	€ 18,750	€ 494,750	0.2%
Grand Total	€ 157,180,603	€ 78,386,235	€ 822,551	€ 236,389,389	100%
	66.5%	33.2%	0.3%		

Source: data received from the GRST on 10 October 2012. Calculations authors.

Appendix E Total Gross value added at basic prices – Central Greece

% of Total Gross value added at basic prices	2005	2006	2007	2008	2009
A - Agriculture, forestry and fishing	10.61	7.94	7.29	6.33	6.72
B-E - Industry (except construction)	30.15	31.08	30.91	29.41	31.99
C - Manufacturing	27.04	27.50	27.41	25.62	28.18
F - Construction	7.93	9.24	7.91	7.11	6.19
G-I - Wholesale and retail trade, transport, accommodation and food service activities	20.60	21.55	23.28	24.94	21.47
J - Information and communication	1.38	1.46	1.44	1.23	1.32
K - Financial and insurance activities	2.22	2.13	1.97	1.81	1.94
L - Real estate activities	7.27	7.10	7.68	8.27	8.65
M_N - Professional, scientific and technical activities; administrative and support service activities	1.97	2.19	2.26	2.37	2.39
O-Q - Public administration, defence, education, human health and social work activities	14.97	14.05	14.28	15.40	15.82
R-U - Arts, entertainment and recreation; other service activities; activities of household & extra-territorial organisations and bodies	2.90	3.27	2.97	3.12	3.52
TOTAL - All NACE activities - in Millions of Euros	8,503.9	8,792.4	9,055.0	9,427.2	9,398.3

Source: Eurostat

Appendix F Relative regional specialisation in 20 industries – Central Greece

	Industry	Rank in Europe	Specialisation	Employment
1	Manufacture of vegetable and animal oils and fats	1	12.35	882
2	Manufacture of tubes	1	10.76	1 427
3	Mining of non-ferrous metal ores, except uranium and thorium ores	2	29.86	1 437
4	Manufacture of cement, lime and plaster	3	15.33	1 511
5	Manufacture of articles of concrete, plaster and cement	3	3.76	2 012
6	Manufacture of grain mill products, starches and starch products	4	6.70	1 493
7	Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations	5	4.62	1 352
8	Manufacture of basic precious and non-ferrous metals	5	6.52	1 656
9	Adult and other education	6	2.86	4 379
10	Manufacture of other food products	8	2.08	5 171
11	Repair of personal and household goods	8	2.63	766
12	Fishing, fish farming and related service activities	9	11.14	2 019
13	Site preparation	10	3.33	2 190
14	Bars	10	2.79	6 312
15	Growing of crops; market gardening; horticulture	11	8.14	28 946
16	Restaurants	12	1.88	9 147
17	Sea and coastal water transport	12	6.25	1 457
18	Farming of animals	16	3.97	4 453
19	Manufacture of structural metal products	18	2.00	3 006
20	Manufacture of builders' carpentry and joinery	19	2.57	1 872

Source: Smart specialisation in Europe: European specialisation data by region Centre for Strategy and Competitiveness, Stockholm School of Economics, April 2011