

RIS3 Regional Assessment: East Macedonia and Thrace

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 priorities and the innovation system

Although one of the most industrialised regions of Greece, East Macedonia and Thrace (EMT) is always one of the regions with the highest share of primary (agriculture) sector in the economy and an important service sector (which, however, is essentially based on non-traded and public services and tourism). The manufacturing sector is dominated by medium to low technology sectors, such as the food industry, textiles and clothing, mining and quarrying, manufacture of pulp, paper and paperboard and tobacco products. In addition, some larger more technology intensive industries particularly in the sectors of chemicals and the manufacture of machinery and equipment are located in the region

The regional R&D intensity is well below the Greek average with a strikingly small contribution from businesses. Hence, R&D expenditure and staff in EMT are concentrated in the Demokritos University of Thrace and to a lesser extent in the Technical Education Institute of Kavala. However, the scientific specialisation of the two higher education institutes does not match well with the industrial specialisation. The region is most specialised in the cutting, shaping and finishing of ornamental and building stone, in the manufacture of accumulators, primary cells and primary batteries as well as in the manufacture of tobacco products, animal farming and growing of crops.

Emerging potential sectors include energy and to some extent niche ICT activities. There are a small number of higher tech firms operating in the region but at the present time there is no structured support for the creation or development of innovative firms. Indeed, the regional innovation support system consists of generalist chambers and development agencies and is rather fragmented.

The expert team **recommends** that the RIS3 strategy process should seek to better identify potential linkages between a number of the main industrial groups located in the region (e.g. examining the potential for ‘industrial symbiosis’) and focus on identifying opportunities for investing in new higher value added niche (e.g. functional foods, specialist textiles, etc.) and on integrating specific critical technologies into the production or service delivery processes (ICT, etc.) in existing manufacturing sectors. This will require a much more structured and collaborative approach both between firms and between firms and technologists and researchers. The regional authority should consider creating a single regional development and innovation agency that would manage the process of implementing the RIS3.

Governance and stakeholder involvement

Previous regional innovation strategy projects in EMT focused on the technological modernisation of enterprises, mainly in the manufacturing sector, and the creation of endogenous capabilities for innovation and new product development. These projects were bottom-up and involved a large number of stakeholders from the ‘triple helix’. However, continuity was lost as the funds available through the ROP 2007-2013 were managed centrally by the GSRT. We recommend that:

- The elected Regional Authority and the IMA should ensure a bottom-up approach along the entire planning process of RIS3 of East Macedonia and Thrace.
- A detailed roadmap of entrepreneurial discovery process should be drafted at the most early stage of RIS3 elaboration.
- As proposed in many other regions, a usual management structure of RIS3 includes decision-making, management and technical support bodies.

The regional vision for 2014-2020 is adopts a broad approach aiming at boosting all three main sectors. However, the expert team note that growth in manufacturing and

energy has the potential to double or even triple productivity. Hence, we consider that the vision of EMT as main manufacturing region of Greece is still valid. We recommend that the RIS3 should mainly focus on the reorganisation of industry towards high technology and innovative activities, with as many enterprises as possible using advanced technology in the production process.

Innovation policy

The ROP 2007-2013 includes a priority for Digital convergence and entrepreneurship that was allocated 4.6% of the funds. However, via the national OP, the EMT region has been awarded just under €8m for 52 projects. The main focus is on engineering and technology (notably in the ICT and energy fields) projects with very little funding for agricultural sciences (despite the dominance of both the primary and agro-food sectors). Moreover, a single company accounts for 30% of the total budget. Hence, the ROP 2014-2020 needs to include stronger measures for innovation and knowledge-based development. Regional priorities should take more into account the industrial economic structure and focus on the internationalization of regional firms. The expert team **recommends:**

- Stronger innovation policy is needed integrating the ideas of smart specialisation, identification of niche markets both in domestic and export markets.
- Higher priority should be given to manufacturing and the regeneration of the industrial tissue of the region.
- Innovation policy measures should be selected based on a number of criteria, notably long run sustainability, high leverage of private investments, etc.

Clusters policy

As EMT 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 with Turkey and Bulgaria, incentives for the development of transnational clusters should be considered. Finally, the Region, should consider the creation of a **cluster secretariat**.

ICT policy, broadband, e-services

In addition to covering the required RIS3 topics regarding ICT, the Region should give a special emphasis to the technological ICT support in the most crucial sectors of the regional economy i.e. farming, livestock, fishing, mining, tourism 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 improving the competitiveness of the whole economy and improving the quality of life.

Special attention should be given to keeping the talented ICT professionals and attracting new ICT businesses by creating new and viable 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. A particular emphasis should be placed on creating a framework for a substantial involvement of the private ICT sector in assuming part of the risk of the planned investments.

2. Regional Innovation Performance and potential

2.1 Regional profile and specialisation

Predominantly an agricultural area, the Region of East Macedonia and Thrace occupies an area of 14,157 km² in the north-east of Greece at the crossroads of Europe and Asia. With a population of approximately 606,000 inhabitants in 2011 (5.36% of the Greek population) it produced 4% of the Greek Gross Domestic Product (GDP) in 2009¹. The economy is based mainly on agriculture and livestock farming, as well as on construction and industrial activity, trade, commerce, transport, education, and public administration. The manufacturing sector has a high concentration of firms in clothing, textiles, food packaging, wood, paper and metal processing. In the tertiary sector, there are considerable opportunities for the development of tourism due to important natural and cultural resources. The region has some of the major Greek water reserve and is expected to be developed as the 'new energy centre', both in production, as well as in transporting and interconnecting with foreign networks, following the implementation of several large-scale energy projects².

With a GDP per capita of €16,500 in 2009 (in PPS), the region ranked 11th out of 13 Greek regions and is lagging well behind (70%) the EU27 average. The level of education of the workforce is relatively low with 18.6% of the population aged 25-64 with tertiary education attainment (25.4% in Greece, 26.8% in EU27). In addition, in line with a national trend, there is a low and declining level of life-long learning in the region; only 1.7% of adults aged 25-64 were trained in 2011 (Greece 2.4%, 8.9% EU27).

The economic crisis has affected economic activity and the unemployment rate increased dramatically between 2008 and 2011 from 8.7% to 19.9%. The main sectors affected by the crisis (RIM, 2012) are trade and services (a large number of shops ceased operations), but also manufacturing and construction. The low levels of foreign direct investments in combination with a relatively low productivity, a slow economic restructuring towards higher value added segments and an increased competition from low cost neighbouring countries are likely to further increase the pressure on the regional productive base and employment (Ketikidis et al, 2010).

The service sector dominates the regional economy and accounts for 72.1 % of the regional GDP in 2009, compared to 22.3% for industry and construction and 5.6% for agriculture (see Appendix E). The share of agriculture in GDP has fallen rapidly over the last decade but the region still contributes significantly to the national production for crops such as wheat, tobacco, cotton, asparagus, potatoes, melons and cucumbers. This output is also the basis for a significant agro-industry. Service activities are mainly in retail trade and tourism as well as public administration and education, hence directed primarily at local needs rather than the national and international markets. The manufacturing sector is dominated by medium to low technology sectors, such as the food industry, textiles and clothing, mining and quarrying, manufacture of pulp, paper and paperboard and tobacco products. In addition, some larger more technology intensive industries particularly in the sectors of chemicals and the manufacture of machinery and equipment are located in the region.

In terms of research and development (R&D) and innovation activities, the region invested €30.5m in R&D (GERD, in PPS) in 2005 (0.33% of regional GDP and 2.25% of the national total). This is well below the Greek average of 0.6% of GDP invested in R&D and the EU27 average of 1.83%. Especially striking is that regional businesses

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

² Gas pipeline TGI (Turkey-Greece-Italy)-already functioning. Oil pipeline Bourgas – Alexandroupoli, gas pipe-line Southstream, high tension networks, hydroelectric projects –some of them already functioning - and renewable resources such as large Aeolian parks-already functioning

invested only €1.6m in R&D (0.02% of regional GDP), or only 5.4% of the total regional GERD (compared to 31% at the national level and 63% in the EU27). The contribution of businesses to R&D investments represents. Since 2008, private R&D investments have most probably not improved given the liquidity crisis.

Hence, R&D activities in East Macedonia and Thrace are concentrated in the public sector and particularly in the Demokritos University of Thrace (DUOTH), created in 1973, and to a lesser extent in the Technical Education Institute (TEI) of Kavala created in 1976. R&D investments by the higher education sector (€25.2m, in 2005) represented 82.7% of GERD (0.28% regional GDP) against an average of 47.5% in Greece and 22.5% in EU27. The government sector contributed 11.5% of the regional R&D (20.3% in Greece, 13.6% in EU27) or €3.5m in investments.

Human Resources for Science and Technology (HRST) increased significantly from 15.9% of the regional workforce (active population)³ in 2000 to 24.9% in 2011 (average for Greece in 2011: 32.4%), or 3.8% of the Greek HRST. There were 1023 R&D staff, full-time equivalent, in 2005, or 0.4% of the regional active population against 0.69% in Greece and 0.95% in EU27. 103 were in the business sector, 863 in higher education and 58 in the government sector. More specifically researchers account for 0.23% of active population (0.4% Greece, 0.59% EU27): 85.3% of the 601 regional researchers work in higher education, 57 in business and 30 in the government sector.

In terms of scientific output, the DUOTH is ranked 8th out of 21 Greek universities with 1,827 publications from 2006-10, or 4.5% of total Greek scientific publications, 22.5% of those involving international co-authorship⁴. However, the DUOTH has a relatively weak citation impact of 0.7⁵. In comparison, the TEI Kavala produced 108 publications from 2006-2010 with an average citation score of 0.71. The DUOTH is active in a broad range of scientific fields: medical and health sciences (3,985 citations over 2006-2010, 918 publications, citation score of 0.7), natural sciences (1,733 citations, 662 publications, citation score of 0.67), engineering and technology (940 citations, 476 publications, citation score of 0.7), social sciences (196 citations, 82 publications, citation score of 1.06) and agricultural sciences (106 citations, 66 publications, citation score of 0.69). The TEI Kavala is active in natural sciences (105 citations, 68 publications, citation score of 0.92) as well as in engineering and technology (93 citations, 60 publications, citation score of 0.53).

This scientific specialisation does not match the industrial specialisation of the region. Comparing the relative regional industrial specialisation to other European regions (see Appendix F)⁶, the region is most specialised in the cutting, shaping and finishing of ornamental and building stone, in the manufacture of accumulators, primary cells and primary batteries as well as in the manufacture of tobacco products. Agriculture, which employs a significant share of the population, is 6th (farming of animals) and 8th (growing of crops) in the ranking.

In terms of innovation outputs, the limited business investment is reflected in the level of patenting activities, with 1.65 patents registered per million inhabitants to the European Patent Office in 2008 in the region, against 8.04 in Greece and 111.58 for the EU27. The limited absorptive capacity and demand by firms for research and innovation services and the absence of infrastructures for enhancing technology

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.

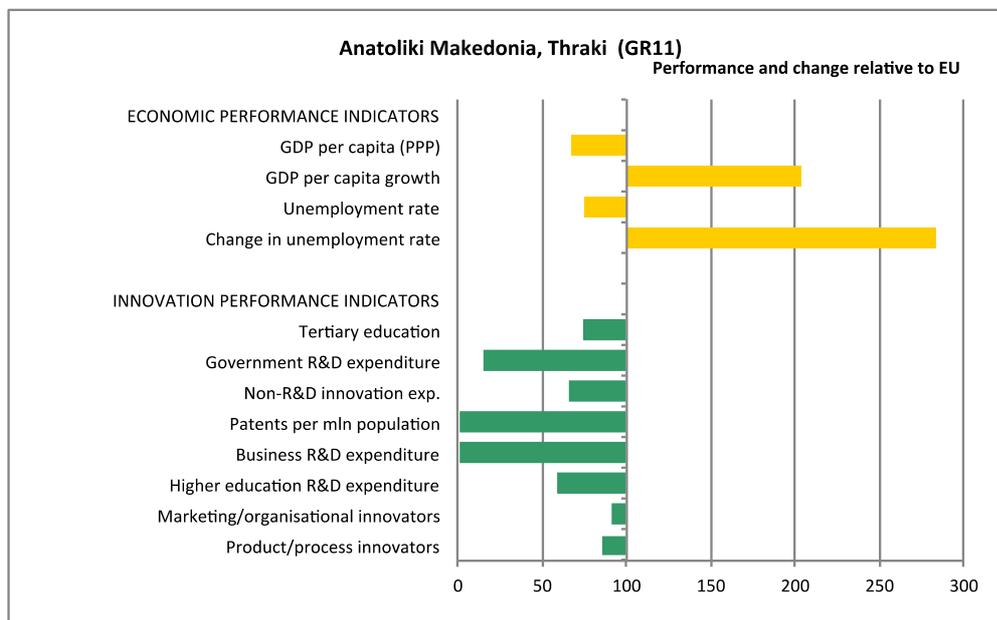
⁴ <http://metrics.ekt.gr/en/report02/index>

⁵ The relative number of citations to publications of a university compared to the world average

⁶ 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).

transfer limit the potential for spillover effects and the creation of long term linkages between regional firms and the higher education sector in the region (RIM, 2012).

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.

Looking at overall innovation performance, the European Regional Innovation Scoreboard⁷ ranks the East-Macedonia and Thrace (grouped in the mega-region Kentriki Ellada) as a modest-medium innovator (the lowest of four performance categories) along with all other Greek regions aside from Attiki. Similarly, the 2011 Regional Innovation Monitor (RIM) annual report classified the region amongst a group of knowledge absorbing innovating regions (again along with all other Greek regions except Attiki). From a positive perspective, this group of 19 EU27 regions has the highest average score (amongst the RIM regional grouping) on ‘innovative entrepreneurship’ (based on the share of SMEs that declare to have introduced innovations in the Community Innovation Survey) but the lowest score on ‘technological innovation’: business R&D and patenting is very low, while the non-R&D innovation expenditures (as a % of turnover) are higher than in any other group. This implies that innovation is mostly through integrating knowledge created elsewhere by purchasing ‘off-the-shelf’ technologies.

Figure 2: SWOT of regional innovation potential and specialisation

Strengths	Weaknesses
<ul style="list-style-type: none"> Improving regional infrastructure (network of newly build roads linking the area with the rest of Greece, SEE and other EU countries) Geographic location, at the crossroad of Europe and Asia, proximity of Thessaloniki Presence of a regional university and TEI 	<ul style="list-style-type: none"> Low productivity and weak economic structure Traditional economy based on labour-intensive activities in low-tech sectors (agriculture) Very small average size of enterprises, leading to an inability to adapt to new developments in management, technology, market trends Low level of overall investments in R&D, and in particular by businesses Low level of ICT diffusion

⁷ MERIT & Technopolis 2012, http://ec.europa.eu/enterprise/policies/innovation/files/ris-2012_en.pdf

Strengths	Weaknesses
	<ul style="list-style-type: none"> • Low level of education of the population and life-long learning practices • Low level of science-business collaboration • Lack of innovation culture within firms
Opportunities	Threats
<ul style="list-style-type: none"> • Better match between scientific and economic specialisation • High renewable energy potential • Demand for ecologically produced agricultural products rising world –wide • Promoting synergies for the transfer of knowledge from higher education to the business community • Improved support to upgrading of SMEs technological capacity 	<ul style="list-style-type: none"> • Brain – drain of highly qualified people towards the Athens, Thessaloniki and abroad • Competition from low-cost economies in traditional sectors • Decline of traditional manufacturing sectors • Degradation of the environment with energy highways posing risks for agro-tourism

2.2 The strengths and weaknesses of the regional innovation system

The main actors in the regional innovation system are listed in Appendix C. The system clearly lacks more specialised institutions and is relatively fragmented with development agencies and chambers located in each prefecture. Unlike some other Greek regions, there is no specialised business innovation centre or technology park/incubator structure. The TEI of Kavala appears to be relatively active in supporting regional firms to develop innovation projects.

In 2007, the report of the MIRIAD project⁸ on East Macedonia and Thrace stated that most of the strengths and opportunities within the region seem to lie in increasing awareness of the need to open up the system in terms of global and regional networking and create synergies between public and private research and innovation activities. The weaknesses and threats include the slow reform of the education system and know-on on commercialising innovation as well the innovation culture and the economic structure. The priority issue was argued to be the creation of a critical-mass for research and innovation (stock of know-how) in terms of infrastructure, engagement of capable skills, entrepreneurial spirit and imaginative policy leadership that will put into use the combined resources effectively making innovation a self-sustaining process that allows for its faster evolution.

A number of interviewees within the MIRIAD project suggested a diversification of the primary production towards greater specialisation combined with the introduction of agro/biotechnologies and synergies with other sectors like life-sciences and environmental technologies towards the combined promotion of pharmaceuticals, specialised foodstuff, health and different types of tourism as a clustered composite product/service. However they state that the creation of a critical-mass might not necessarily require complex sectorally focused strategies but could arise as a result of horizontal strategies like triple-helix interaction, market demand and state-of-the-art scientific practices. The main barriers identified are the institutional and cultural bottlenecks that need decisive policy actions. However, it was also acknowledged that any chosen strategy will have significant requirements in specialised personnel, links with the scientific community and innovative entrepreneurship that does not correspond to the ageing rural workforce, operating small holdings producing traditional crops relying on subsidies. It would further be constrained by the predominance of self-employed and civil servants in regional employment coupled with low quality entrepreneurial practices.

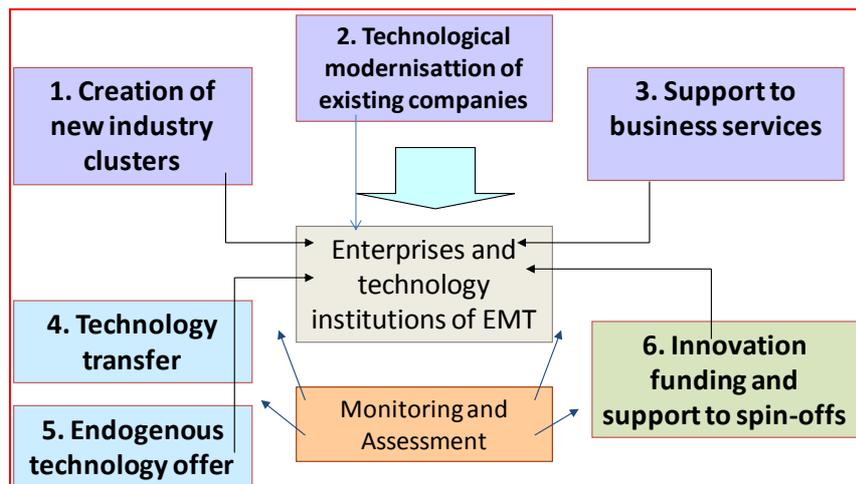
⁸ http://miriad.group.shef.ac.uk/regions_greece.html

3. Stakeholder involvement and governance of research and innovation policies

3.1 Stakeholder involvement in strategy design and implementation

Previous experience in collaborative innovation policy in East Macedonia and Thrace includes: a Regional Innovation and Technology Transfer Strategy (RITTS) prepared from 1999-2001, and a Regional Innovative Action Programme (Technogenesis) implemented from 2005-07 focused on “technology clinics” for new product development.

Figure 3: RITTS EMT objectives



Both the RITTS-EMT and Technogenesis focused on the technological modernisation of enterprises, mainly in the manufacturing sector, and the creation of endogenous technology capabilities for innovation and new product development. Technogenesis implemented a successful methodology developed by TEKES (Finland), which follows a roadmap of (1) open competition and awards for new product ideas, (2) elaboration of business plans for the most promising ideas with support of technology clinics, and (3) funding and implementation of best business plans.

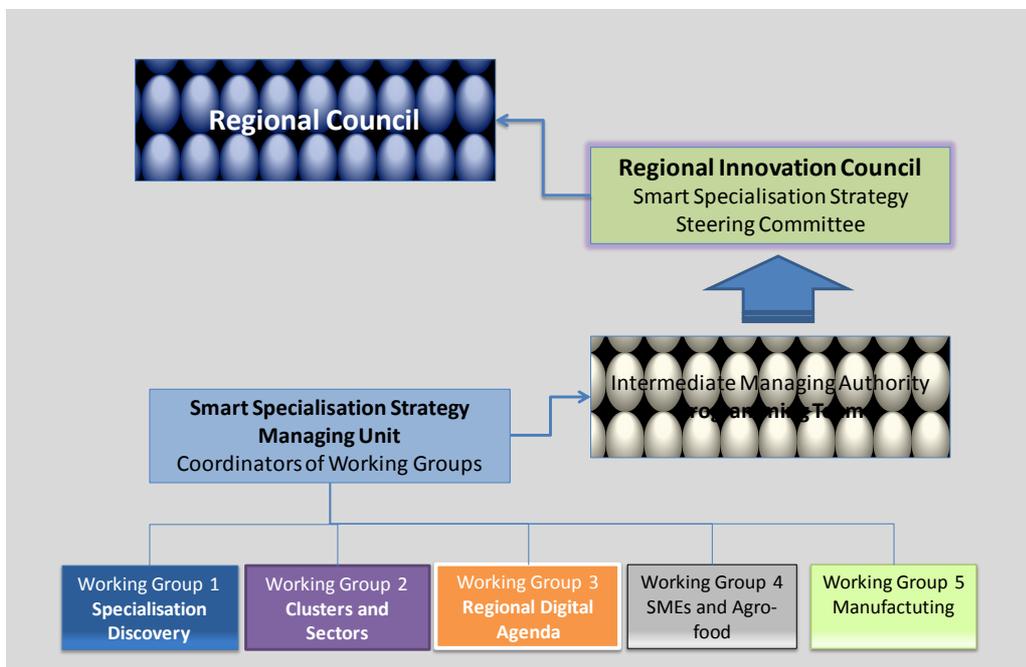
Both projects were based on a bottom-up approach and a large number of stakeholders from the ‘triple helix’ were involved (i.e. for the RITTS a steering committee formed by 20 organisations). However, continuity was lost as the funds available through the mainstream ERDF regional operational programme (ROP) 2007-2013 were used for measures designed and managed centrally by the GSRT.

For the 2014-20 period, the newly elected Regional Authority has taken the lead in regional innovation planning. In the meeting organised by the Regional Authority (in Alexandropoulos, 4 October 2012), 75 participants from various public organisations, universities, and companies were informed about the RIS3 concepts and processes and the regional authority made a call for participation in the elaboration of the RIS3 strategy. Most participants expressed their interest and willingness to be involved, and called on the region to define the process and rules of participation. However, the expert team notes the relative absence of business representatives even if overall stakeholder involvement is good. Equally, the regional authorities has not yet set out any plans for the identification of market opportunities and how they would organise an entrepreneurial discovery process.

Recommendations

- The elected Regional Authority and the IMA should ensure a bottom-up approach throughout the entire RIS3 planning process in East Macedonia and Thrace.

- A detailed roadmap for an entrepreneurial discovery process should be drafted at in the early stage of the RIS3.
- As proposed in other regions, the RIS3 management structure should include the following decision making, management and technical support bodies:



3.2 Multi-level governance and synergies between policies and funds

The initial proposal of the EMT Region for a 2014-20 strategy⁹ includes a series of actions that presuppose multi-level governance and synergies. The need for cooperation with the Ministry of Development, Competitiveness, Transport and Networks is specifically referred to. It is clear that the strategy and its priority-setting are complementary to national-level priorities and it is based on the principles of inter-departmental coordination. However, there is no information on whether the strategy will seek to produce synergies between different European, national and regional funds, in particular between ERDF, ESF, Horizon 2020 and COSME.

Recommendations

- The RIS3 of East Macedonia and Thrace should seek to mobilise all source of funds that will be available for the implementation of innovation and ICT actions regardless of the authority that will manage the measures (RIS3 Guide page 47).
- The region in collaboration with GSRT should define how regional and national objectives could be aligned; and how the region will leverage most effectively funds available through national sectoral OP programmes.

3.3 Vision for the region

The vision of the Region of East Macedonia and Thrace (EMT) is defined in the following way: “After thirty years of regional development policy, the Region of EMT, despite what has been achieved, remains one of the weakest EU regions. After Epirus

⁹ Πρόταση Περιφέρειας Ανατολικής Μακεδονίας – Θράκης για τη διαμόρφωση των κατευθύνσεων, Εθνικής Αναπτυξιακής Στρατηγικής Προγραμματικής Περιόδου 2014-2020. Proposal of the Region of East Macedonia – Thrace in response to the guidelines for the National Development Strategy for the 2014-2020 Programming Period.

and Western Greece, Eastern Macedonia-Thrace has the lowest GDP per capita in the country. This situation applies over time and the current economic situation has deteriorated it. Any positive effects of EU regional policies exercised in the past have been limited and even reversed by increasing competition and the current effects of the crisis. In this context, the vision of the Region for the new programming period is:

The gradual reconstruction and modernisation of the production model of the region, maintaining, and where possible deepening of social cohesion in an environment of increasing competition, recession and crisis, exploiting the resources of the region, mobilising existing and new social collectives and exploiting its geographical position.”

(Region of East Macedonia and Thrace, 2012)

Within the geographical division of production activities in Greece, the region of EMT appears as a manufacturing region with the highest share after Sterea Ellada (in fact Attica) of GDP in manufacturing. Manufacturing growth in EMT has been led by top-down regional development policy and significant state incentives through the Development Laws. The industrial complex created is highly outward-looking exporting most production to other Greek regions and abroad. It is correct to underline that the current crisis has reversed the positive effects of previous regional policies, but this should not lead to a revision of the fundamental objective of regional development in EMT, namely manufacturing growth.

Recommendations

The primary objective of the Region in the forthcoming period 2014-2020 (balanced development of all three economic sectors) is not feasible because of the large productivity differences among these sectors in all types of EU regions¹⁰. However, a sustained growth in manufacturing and energy sectors would have the potential to double or even triple productivity. Hence, the long-term objective of EMT as a main manufacturing region of Greece is still valid and should be pursued. The objectives of industry development should not concern only the “exploitation of natural resources in the region”, “rational management of water resources”, “support of dynamic SMEs”, “utilisation of existing infrastructure” and “setting up of clusters”, but mainly focus on the reorganisation of industry towards high technology and innovative activities, based on supporting as many industrial enterprises as possible to apply advanced technology in the production process (as stated in the SWOT analysis).

4. Towards a regional smart specialisation strategy

4.1 Regional research and innovation policies

The ROP 2007-2013 of East Macedonia and Trace includes three priority axes with a breakdown of funds as presented in Figure 4. Less than 5% of funding is allocated to the priority "Digital Convergence and Entrepreneurship", however, this is in the context of most support for these themes being delivered through the national OPs "Digital Convergence" and "Competitiveness and Entrepreneurship".

The text of the ROP foresaw that under this priority (see Figure 5) support would be provided to promote investment projects in manufacturing, trade and services, especially in areas or sectors facing restructuring of economic activity (i.e. rural areas, border areas) or for diversifying specific forms of tourism (i.e. agro-tourism) in line with the spatial priorities of the NSRF. It was also foreseen to support actions to

¹⁰ European Commission (2008) Growing Regions, Growing Europe. Fifth progress report on economic and social cohesion. Communication from the Commission to the European Parliament and the Council. COM(2008) 371 final.

protect the rich geothermal sources, thus contributing to the rational management of energy resources and utilisation of renewable energy.

Figure 4: Priorities and funding of OP East Macedonia and Thrace 2007-2013

Priority axis	Total funding EU + national	%
1. Infrastructure and accessibility	301,696,300	37.34
2. Digital convergence and entrepreneurship	37,205,000	4.60
3. Sustainable development and quality of life	457,791,700	56.66
Technical support	11,307,000	1.40
Total	808,000,000	100

Figure 5: Regional priorities for innovation and entrepreneurship 2007-13

Policy Documents	Priorities and objectives
<p>Operational Programme of East Macedonia and Thrace 2007-2013, Athens 2007.</p> <p>Επιχειρησιακό Πρόγραμμα Περιφέρειας Ανατολικής Μακεδονίας και Θράκης 2007-2013, Αθήνα 2007</p>	<p>Improving competitiveness and internationalization of enterprises</p> <ul style="list-style-type: none"> • Expansion of activities and business sales • Creation of new businesses and jobs • Economic integration of specific population groups • Support economic transformation in specific rural and border areas • Modernisation of tourist facilities and services • Protection and enhancement of the regional energy reserves <p>Indicative actions</p> <p>Specific objective: introduction of innovative ICT services and applications to SMEs through support for business plans that contribute to:</p> <ul style="list-style-type: none"> • The promotion of e-commerce • The electronic interconnection business • Online advertising • Development of electronic sales channels • Establishing online shops • Computerised procurement and stores. <p>Specific objective: promoting investment and business plans in various productive activities in the fields of manufacturing, trade and services:</p> <ul style="list-style-type: none"> • Support investment and business plans aimed directly at innovation, quality and specialised processing and special forms of tourism • Enhancing business creation by specific groups • Fostering entrepreneurship in rural and border areas particularly o restructure their economic activity <p>Specific objective: rational management of energy resources</p> <ul style="list-style-type: none"> • Implementation of spatial planning for the protection of geothermal resources the Region.

According to data received from the GSRT (see Appendix D), 52 projects have been funded in East Macedonia and Thrace by the OP Competitiveness amounting to a total budget of €7.8m (or approximately €150k on average per project), or 3.29% of the total budget disbursed nationally (€236m). Just over three-quarter of the funding has been allocated to companies (€5.9m) and the remainder to research organisations (€1.86m). In terms of the thematic breakdown, 56.0% of funding was allocated to Engineering and Technology projects (the third highest share for this field after Sterea Ellada and Western Greece), 22.8% to exact sciences, 16.6% to medical sciences and only 3.4% to agricultural sciences (despite the strong regional economic specialisation). An alternative categorisation used by the GSRT suggests that the engineering and technology projects are mainly concentrated in the ICT field (41%) followed by the energy technology (20%). Finally, although there were 52 projects, the top 10 projects account for 60% of the budget, and indeed the seven projects secured by a single company account for 30% of the total budget.

In the forthcoming programming period 2014-2020, research, innovation, digital convergence and SME support priorities in the Regional Development 2014-2020 report (draft provisional version) are as follows:

Strengthening research, technological development and innovation

- Turn agricultural production into new dynamic products
- Utilisation of geothermal energy in agricultural production
- Strengthening of high-tech clusters
- Promotion and integration of innovation in agricultural production, in products and in production processes
- Strengthening cooperation with HEI and TEI
- Promote collaboration of existing institutions, vocational education and training.

Enhancing access, use and quality of information and communication technologies

- Interaction and communication with Municipalities located in the spatial territory, with other regions and the central public administration bodies.
- Better service to citizens and businesses in the region.
- Internationalisation-networking: expanding communication and closer cooperation in the region.

Enhancing the competitiveness of SMEs, the agricultural sector (for the EAFRD) and fisheries and aquaculture (for the EMFF) (Thematic Objective 3)

- Support and modernisation of SMEs
- Introduction of new trade routes in wholesale and retail trade
- Promotion of products in which the country has a deficit
- Promotion of local agricultural, livestock and fisheries production.

Since the 1980s, Greek industrial activity has been decentralised and a dynamic industrial complex was created in East Macedonia and Thrace based on: food and beverage production, textile and clothing, furniture, as well as intermediary industries of paper pulp, chemicals, and plastics. Due to high levels of State Aid, a range of companies located to the industrial areas of Xanthi, Komotini, etc. The character of this decentralisation was unlike that in other European and south European countries, where large firms decentralised their activities and set-up branch plants in peripheral areas. In Greece decentralisation was based on the creation of new firms and on the endogenous dynamism of traditional industry branches. However, the absence for many years of research and technological development policy led this initially dynamic complex to stagnation, severe crisis and de-industrialisation. The figures of the current OP are quite significant. In one of the most industrially intensive Greek regions, competitiveness and innovation are allocated less than 5% of funding, and current spending is below 3.5% of the national spending. In the forthcoming period, priorities regarding SME competitiveness and innovation hold the 2nd and 5th position in the hierarchy of regional priorities.

Both the actual OP and the initial plans for 2014-2020 need stronger measures for innovation and knowledge-based development. Neither identifies existing/potential niches for smart specialisation and related upgrading of existing activities. Regional priorities should take more into account the industrial economic structure of the region and the efforts made for its creation in the recent past. More positively, initial orientations of the regional strategy 2014-2020 are outward looking setting the internationalization of the region and the accessibility to international markets high among regional priorities.

Recommendations:

- Stronger innovation policy is needed integrating the ideas of smart specialization, identification of niche markets both in domestic and export markets.

- Higher priority should be given to manufacturing and the regeneration of the industrial tissue of the region.
- Innovation policy measures should be carefully selected applying the following criteria (1) long run sustainability after the initial support period; (2) creation of capabilities and know how in the region; (3) offering integrated solutions to technology-production-market-funding; (4) leading to high leverage of private investments; (5) involving a large number of beneficiaries; and (6) contribution to development goals of competitiveness and employment.

4.2 Cluster and entrepreneurship policies

The sectors in East Macedonia-Thrace with the highest combined scores in size¹¹, specialisation¹² and focus¹³, according to the Cluster Observatory rating system, are presented in Box 1. The region is one of the few in Greece to have a three star cluster.

Box 1 Sector Size, Specialisation and Focus in East Macedonia-Thrace

3 stars: *Farming & Animal Husbandry*
 2 stars: *Agricultural Products*
 1 star: *Processed food, Construction Materials, Maritime*

However, there is not a mature¹⁴ cluster in the region even if there are quite a few organic and emerging ones that could be further developed if the appropriate cluster policies were applied (see Box 2). Furthermore, this box provides hints for the identification of opportunities at the interface between different disciplines/industries/clusters and the deployment of cross-clustering measures.

Box 2: Mature and Emerging Clusters in East Macedonia-Thrace

Mature Clusters:

None. The following regional entities are, however, members of the microelectronics-based systems and applications cluster (mi-Cluster, www.mi-Cluster.gr): Prisma Electronics, Lamda Electronics, Marak Electronics, Electronics Lab of the Demokritos University of Thrace and the Industrial Informatics Department of the Technological Educational Institute of Kavala.

Emerging Clusters:

Farming & Animal Husbandry (farming of animals, fishing, fish farming and related service activities, growing of crops combined with farming of animals), Agricultural Products (organic farming), Processed Food (wineries, manufacture of tobacco products, manufacture

¹¹ 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.

¹² 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.

¹³ 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.

¹⁴ 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.

of beverages, dairy products), Stone Quarries, Construction Materials (cutting, shaping and finishing of ornamental and building stone), Chemical Products (manufacture of basic chemicals, manufacture of accumulators, primary cells and primary batteries), Transportation and Logistics (retail sale of automotive fuel), Oil and gas (extraction of crude petroleum and natural gas, geothermal resources, renewable energy sources, energy corridors), Maritime (sea and coastal water transport), Tourism and Hospitality (eco-tourism, green tourism, etc), Telecom/IT (electronics), Furniture, Paper Products.

At the meeting held on 4 October 2012, the Region of East Macedonia-Thrace stated their willingness to implement cluster policies for the sectors in which a competitive advantage exists. However, without previous experience on **cluster policies** and with 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).

A, non-exhaustive, list of cluster actors (associations, unions, networks, leading businesses, key research actors, local financing institutions, industrial zones, etc) that could become champions in the development of clusters in the region can be found in Appendix C. The expert team advice is based on data available mostly up to 2009 and therefore the region should update the existing analysis with more recent data wherever possible to base the RIS3 strategy on strong foundations. Furthermore, more qualitative focus studies should be carried out in the fields of activity where the region has relative specialisation to identify niches. This will require expert work on **value chain analysis** and an analysis of the linkages between clusters/ industries/sectors, in order to examine related variety across the areas of regional specialisation. It is **recommended** that an emphasis should be given to facilitating **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 with other key sectors in the region.

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 with Turkey and Bulgaria, incentives for the development of transnational clusters should be considered. Finally, the Region should consider the creation of a **cluster secretariat** or support/co-operate with one at national level.

During the 2007-2013 programming period, in East Macedonia-Thrace and the OP "Competitiveness and Entrepreneurship", 83 Actions (€ 58.3 million budget) are implemented in the areas of technology transfer and 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. Entrepreneurial and innovation support services (like one-stop-shops) have been promoted by various organisations, notably through Structural Fund projects. However, despite the efforts of such intermediaries, collaboration between 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 noted in Appendix C, three industrial zones and an industrial park operate in the region, offering mainly real estate services, none of which have a sectoral focus. To date, an incubator structure has been established. The zones and parks are rightly considered as an opportunity in the 2014-20 EMT Strategy. It is **recommended** to further develop the zones and parks by offering added-value services to tenants and provide incentives for the establishment of one or more incubators in combination with the DUTH, the TEI and/or clusters. 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

other northern Greek regions to ensure a minimum necessary deal flow, the creation of a **business angel network** and possibly a co-investment fund.

4.3 Digital economy and ICT policies

Demand for ICT products and services in the East Macedonia and Thrace are extremely low, 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)¹⁵ of the Observatory for Digital Greece¹⁶, the PC usage and the use of the Internet was measured at just 39%.

The most notable ICT projects that have been implemented were concerned with the implementation of metropolitan access optical networks (MAN) and municipal wireless hot-spots, the development of content for the disabled, digitising of historical monuments, and the networking of the higher education institutions and the school units to the national research and education network and the Internet.

A quite small number of ICT SMEs are present in the region, focusing on system integration, maintenance, and software support for state agencies and for the retail industry. The Region suffers from considerable and a prolonged drain of talented ICT professionals, as the relevant jobs are limited. The young ICT graduates of the local higher education institutions are normally moving to other regions, thus creating additional challenges to any recovery effort.

According to the preliminary strategic directions of the Region¹⁷, the following sectors are best suited to benefit from modern ICT tools and technologies:

Primary sector: it represents a significant portion of the regional economic activity, with remarkable growth potential if combined with modern ICT tools. Agriculture, fishing, aquaculture and mining enterprises are in urgent need to accommodate modern control, administration, monitoring, marketing, and logistics tools. Added value bio-agricultural and 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 alternative methods, like existing geothermal sources or biogas.

Food & Beverages: SMEs in food and beverages can also improve their profit margins by better branding and advertising, using new-generation ERP and CRM tools, along with e-commerce and procurement platforms.

Tourism: although tourism represents a small portion of the current economic activity, it should be underpinned, because the Region hosts numerous of unexploited archaeological and religious sites, and several mineral springs, capable to attract a significant number of 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.

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

¹⁵ 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

¹⁶ See: <http://www.observatory.gr>

¹⁷ “Πρόταση Περιφέρειας Ανατολικής Μακεδονίας – Θράκης για τη διαμόρφωση κατευθύνσεων εθνικής αναπτυξιακής στρατηγικής προγραμματικής περιόδου 2014-2020”, Περιφέρεια Ανατολικής Μακεδονίας - Θράκης, Οκτώβριος 2012.

services could be easily combined with proper initial training applications, to overcome the barriers of low IT skills.

Health: health services are often out of reach for citizens living in remote mountainous or insular 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 citizens. These services would be provided as public-private partnerships (PPPs), in cooperation with local state hospitals and health centres, to ensure sustainability.

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. More specifically, it should make the Industrial Zones/Parks “FtH-ready”, i.e. bringing fibre to each hosted enterprise. The same can be done for selected neighbourhoods, by connecting the respective households with a passive “open-access” FtH local network. It is also crucial to facilitate additional actions like setting-up of 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 provide proper incentives for the expansion of next generation cellular networks (e.g. LTE).

Finally, the Region should consider a flexible mechanism, tailored for its particular size and needs, to ensure a substantial private sector involvement in the project cycle and risk sharing. This can be best carried out by flexible PPPs, or by the establishment of targeted ICT Vouchers for selected households or SMEs.

Regarding other specific RIS3 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 (cadastre, e-prescription, e-invoicing, etc) are administered by national authorities and, therefore, require co-operation between regional and national agencies. Other e-services, such as local taxation or regional permits should be administered regionally. All e-government services should adhere to well-defined interoperability standards, and be based on dependable cloud computing platforms¹⁸.
- There is no reference in the 2014-20 strategy to viable plans for the deployment of new, and the extension of existing NGA networks.
- The Region should prepare an inventory of ICT infrastructure.
- The Region should ensure the active involvement of the private sector in ICT activities so as to both leverage funding and improve sustainability.

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 period¹⁹ and the IMA, regional authorities, etc, should make

¹⁸ http://ec.europa.eu/information_society/activities/cloudcomputing/docs/com/com_cloud.pdf

¹⁹ See: <http://bit.ly/Igzx5T>

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.

Appendix A List of people attending regional workshop

Separate file

Appendix B List of key documents and reference materials

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)

ΕΣΠΑ (2007) Επιχειρησιακό Πρόγραμμα Μακεδονίας Θράκης 2007-2013 (Operational Programme of Macedonia and Thrace 2007-2013), Αθήνα 2007.

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Region of East Macedonia and Thrace (2001) Regional Innovation and Technology Transfer Strategy – RITTS EMT, European Commission, DG Enterprise.

Region of East Macedonia and Thrace (2007) Technogenesis: Regional Innovative Actions Programme of East Macedonia and Thrace, European Commission DG Regio.

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=GR11>

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

Ketikidis P., Zigiari S., Zaharis N. (2010), Regional Innovation and Competitiveness: Analysis of the Thessaloniki Metropolitan Region

South East European Research Centre (2007), Central, East Macedonia and Thrace Knowledge Investment Strategy, prepared within the European project MIRIAD (Managing and Infusing Research Investment and Development), FP6-2004-KNOW-REG-2

Appendix C Key actors in the regional innovation system

Leading Businesses:

Egnatia, Marak Electronics, Prisma Electronics, Lamda Electronics, Talos Robotics, Dasteri Systems, Raycap, Advanced Lithium Systems Europe, Sunlight, E-Value, Georesources Technology, Pharmathen International, dnalex, Helesi, FHL Kyriakidis, Pavlidis Marble Granite, Kreka, Kvala Oil, Thermoplastiki, Interplast, Sekap, Thrace Plastics Group, Neogal, Zouras Farm, Evrofarma, Farm Kaplanidis, Spinning Mills of Thrace, Alfa Beta Roto, Distillery-Winery of Thrace, Thrakika Ekkokistiria, Shelman, Macedonian Thrace Brewery, Milk In of Xanthi Rodopi., Ismaros-Doukidis, Hatziloukas, Komotini Papermill-Elina, Achaika Plastics, Diaxon, Mylonopoulos, Hatzigeorgiou, Nico Lazaridi Drama, Domain Costa Lazaridi, Domain Biblia Chora, Domain Kikones, Sgouridi Wines, Recatec.

Key Research Actors:

The research fabric is mainly composed of the Demokritos University of Thrace, the Technological Educational Institute of Kavala, the University Hospital of Alexandroupolis, the Cultural and Educational Technology Institute (CETI) of the Research Centre Athena, the Thrace Branch of the Institute for Language and Speech Processing (ILSP) of the Research Centre Athena, the Fisheries Research Institute of NAGREF, the Xanthi Branch of the Institute of Geology and Mineral Exploration (IGME).

Financing: Cooperative Bank of Evros

Incubators, Industrial Areas/Zones/Parks:

Industrial Zone of Alexandroupolis, Industrial Zone of Komotini, Industrial Zone of Xanthi, Industrial Zone of Drama, Industrial Park of Kavala.

Principal Intermediaries:

Regional Development Agencies of Rodopi, Kavala, Drama, Xanthi, North Evros, Dimossineteristiki Evros, Investor Reception Centres in Evros, Kavala, Xanthi, Rodopi Chamber of Commerce & Industry of Rodopi, Chambers of Drama, Evros, Kavala, Xanthi, Hoteliers Association of Drama, Thassos, Thrace, Kavala, Economic Chamber (Chapter of Thrace, Chapter of East Macedonia), Technical Chamber of Greece (Chapter of Thrace, Chapter of East Macedonia), Association of Industries of Rodopi, Association of Industries and SME-Sized Industries of Evros, Xanthi, East-Macedonia, North Evros, Federation of Professionals, Craftsmen & Merchants of Drama, North Evros, Xanthi, Rodopi, Kavala, New Orestiada, Soufli, Didimotiho, International Exhibition Centre of East Macedonia-Thrace.

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%
North Aegean	€ 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%
South Aegean	€ 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 – East Macedonia and Thrace

% of Total Gross value added at basic prices	2005	2006	2007	2008	2009
A - Agriculture, forestry and fishing	9.80	6.79	7.18	5.66	5.59
B-E - Industry (except construction)	14.10	14.64	15.18	15.60	16.47
C - Manufacturing	9.99	10.23	10.53	10.67	12.23
F - Construction	7.27	8.73	7.53	6.62	5.81
G-I - Wholesale and retail trade, transport, accommodation and food service activities	24.79	25.11	26.92	27.49	23.23
J - Information and communication	2.00	2.22	1.89	1.70	1.73
K - Financial and insurance activities	3.15	3.18	2.83	2.58	2.74
L - Real estate activities	7.58	7.41	7.71	8.27	8.40
M_N - Professional, scientific and technical activities; administrative and support service activities	3.27	3.59	3.75	3.21	3.30
O-Q - Public administration, defence, education, human health and social work activities	23.41	23.69	22.95	25.46	28.80
R-U - Arts, entertainment and recreation; other service activities; activities of household & extra-territorial organisations and bodies	4.62	4.64	4.06	3.40	3.93
TOTAL - All NACE activities - in Millions of Euros	6,957.7	7,219.4	7,756.3	8,077.1	8,263.9

Source: Eurostat

Appendix F Relative specialisation in 20 industries – East Macedonia & Thrace

	Industry	Rank in Europe	Specialisation	Employment
1	Cutting, shaping and finishing of ornamental and building stone	1	6.83	1 758
2	Manufacture of accumulators, primary cells and primary batteries	2	16.03	656
3	Manufacture of tobacco products	3	19.28	1 155
4	Retail sale of automotive fuel	4	2.71	1 715
5	Adult and other education	4	3.04	4 822
6	Farming of animals	5	8.10	9 428
7	Provision of services to the community as a whole	5	4.96	14 785
8	Growing of crops; market gardening; horticulture	7	11.36	41 861
9	Extraction of crude petroleum and natural gas	9	5.43	518
10	Quarrying of stone	10	5.47	771
11	Bars	11	2.70	6 343
12	Fishing, fish farming and related service activities	12	7.46	1 403
13	Growing of crops combined with farming of animals (mixed farming)	15	1.65	5 842
14	Site preparation	19	2.60	1 777
15	Sea and coastal water transport	28	3.27	791
16	Repair of personal and household goods	30	1.83	554
17	Retail sale not in stores	31	1.66	1 587
18	Other recreational activities	37	1.74	1 055
19	Manufacture of basic chemicals	39	1.65	1 136
20	Manufacture of beverages	40	1.76	1 115

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