

RIS3 Regional Assessment: Western Greece

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

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1. Executive summary

Smart specialisation priorities and the innovation system

Overall the Western Greece regional innovation system is relatively weak. Despite relatively strong public funding for research, regional business innovation performance is poor and productive sectors lag behind in adopting technology and, particularly, more radical product/service innovation. However, the region has a number of strengths, in terms of position and infrastructure but also existing or emerging sectors on which it is possible to build a more competitive economy.

The failures of past regional innovation strategies were mainly due to a focus on policies aimed at creating technology intermediary organisations rather than leveraging and enhancing the internal capabilities of private sector firms. Most innovation support networks and structures created have not survived after public funding ended. Hence, the capacity to implement innovation policy at the regional level remains weak. Moreover, as Structural Fund support for research and innovation has been largely centralised at national level, there has been a lack of resources allocated to developing regional innovation policy planning and management capacities.

In terms of innovation and specialisation priorities, we recommend to:

- Focus the regional RIS3 strategy on the ‘bio-economy’ given the current economic structure and scientific specialisation.
- Create thematic ‘industry innovation working groups’, with representatives from the public-academic-business sectors to set specific targets for their sector/cluster and analyse the sectoral innovation needs.
- Consider alternative options for increasing the in-house ‘absorption’ capacity of regional manufacturing and knowledge intensive service firms through the creation of a graduate placement (innovation manager) scheme to stem a brain drain and encourage skilled engineers and specialists to return.

The RIS3 policy for Western Greece should foster increased co-operation among ‘innovation institutions’, guiding and managing innovation activities and assuring the long-term sustainability and cost-effectiveness of regional innovation policy.

- The region should consider merging or closing the existing publicly funded intermediaries and replacing them by a single regional innovation and enterprise agency. This agency could manage a global grant during 2014-20 to ensure a more cost-effective and co-ordinated service in line with the RIS3 priorities.
- Financial support for investment is critical in the current context but international evidence suggests it is most effective when twinned with mentoring/coaching and manufacturing advisory services. As part of the design of the regional RIS3 strategy, a working group of financial professionals and business representatives should set out a proposal for a more integrated response. Due attention should be paid to ‘educational and training activities’ on both the investor and investee (regional businesses) sides.

Governance and stakeholder involvement

- Starting with RIS3, the Regional Authority and the IMA of Western Greece need to establish a framework of bottom-up strategic planning with the direct involvement of regional stakeholders. The rules of participation, roles and responsibilities of collaborative governance should be clearly defined.
- An initial estimation about the overall budget of the ROP and allocation to a limited number of priorities – research and innovation in particular – would be necessary as a part of a baseline scenario at the start of the RIS3 process.
- The Regional Authority and the IMA of Western Greece should adopt an ‘innovation system’ perspective for the elaboration of RIS3, describing the weaknesses of the regional system of innovation and formulating a policy mix to address them.

- A unified national/regional monitoring and evaluation system should be implemented including cycles of monitoring-assessment and revise/adaptation of RIS3. Cooperation with other Greek regions is necessary for a common M&E system.

Clusters policy

(1) use recent cluster mapping data and techniques to identify regional competences and assets; (2) support and consult existing clusters to meet the objectives of smart specialisation; (3) replicate an effective industrial cluster development approach to facilitate the rapid spread of good practice and ideas; (4) seek and provide advice on what methodology to use to develop clusters, and consider the creation of a cluster secretariat; (5) strengthen the cooperation of existing clusters to make connections to local, national and global value chains; (6) facilitate cross-clustering and the identification of innovation opportunities at the interface between different clusters; (7) create specialised one-stop-shops for the regional specialisations and competences, preferably within existing structures to support mainly SMEs; (8) develop further, incubators and accelerators that provide wide range of services including training, business angel networks, etc, (9) ensure a qualitative upgrade of the tourism sector to develop the alternative types of tourism (eco-tourism). Specific funding measures and support should be developed aimed at tourism innovation and inter-linkages with other productive sectors (bio-agro-food, ICT, etc.); (10) seek to enhance the competitiveness of SMEs in the agricultural and fisheries sectors where aquaculture could be a key objective of the rural development policy; (11) deploy incentives for the fishing sector to restructure fishing organisations, producers' organisations and other stakeholders; (12) ensure that support in rural areas is directed to young people through support for business start-ups in the agro-food/forestry sector.

ICT policy – broadband – e-services

In addition to incorporating ICT as a core topic in the RIS3 strategy, the Region should strengthen support on ICT for the most crucial sectors of the regional economy i.e. primary sector, transportation, health services, manufacturing, food & beverages, and education. 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, gradually aiming at FttH, is a strategic step for improving the competitiveness of the whole economy and improving the quality of life. Education should be supported to both improve the average digital skills of the citizens and also direct the research community towards innovative products and services. ICT services can help transform Western Greece into a business-friendly region and an attractive investment destination. An emphasis should be given to the conditions for a substantial role for the private sector in assuming part of the risk of the planned ICT initiatives.

2. Regional Innovation System - performance and potential

2.1 Regional innovation performance and specialisation profile

With a Gross Domestic Product (GDP) representing 66% of the EU27 average and a GDP per capita of €15,500 in 2009 (in PPS)¹, Western Greece is the poorest region of Greece and one of the poorest in the EU27 (ranked 213th). Gathering 6.6% of the Greek population in 2011, Western Greece belongs to the least developed regions of the country, along with Eastern Macedonia-Thrace, Central Macedonia, Thessaly and Epirus. Unemployment increased sharply from 9.6% in 2008 to 17.3% in 2011.

The services sector accounted for 72.8% of the regional added value in 2009 while the contribution of the sector of industry and construction was of 19.8% and that of the agricultural sector of 7.32%, declining over the past decade, but with a slight increase between 2008 and 2009 (see detailed table in Appendix D). As highlighted in the CTI report (2007), the primary sector is a significant source of employment and commercial activity, but remains uncompetitive due to high costs, low products quality and weaknesses in the field of distribution and merchandising. Manufacturing activity is mainly concentrated in the sectors of food and drink, clothing, the wood-cork industry, metal products and construction. Western Greece is an essential transport hub, which has led to an intense development of international sea transport and trade to and from its port. The prospects for developing tourism are also favourable.

Private businesses of Western Greece are characterised by low competitiveness of products and services, low level of education and specialisation of human capital, low usage of ICT, and low labour productivity. In 2011, only 54% of 15-64 years olds are in employment, the 25-64 years long-life learning rate is only 2.4% (2.4% for Greece and 8.9% for EU27), the level of education of the workforce is relatively low with 21% of the population aged 25-64 with tertiary education attainment (25.4% in Greece, 26.8% in EU27), although gradually improving over the last decade. In terms of the digital economy², the region was in 7th position (39%) for Internet users in 2008, although it is encouraging that Western Greece had the third highest increase nationally in the use of the Internet over the period 2005-08 (154%). At the household level, the percentage of home Internet connection is 30.7% (8th place) but in comparison with GDP per capita the region is in the fourth position suggesting that public intervention may have assisted in reducing the digital divide due to low income.

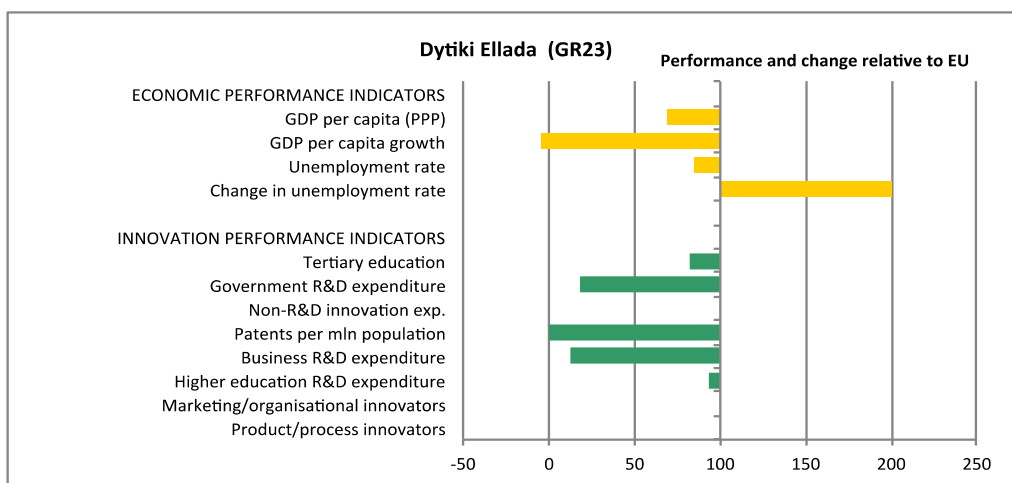
However, in terms of innovation potential, Western Greece ranks fourth out of 13 regions nationally, even if ranks lowly in comparison to the European average. One of the factors contributing to the relatively better 'innovation potential' ranking, compared to economic performance, is that the region has an above average (but still very low) share of GDP allocated to R&D (0.8%, 2008). However, this is almost exclusively in higher education institutes (HEI, which account for 65% of GERD) and public research institutes/centres. In contrast, business expenditure on R&D (BERD) only amounts to 14% of the regional GERD, even if the region is ranked 1st in terms of the share of GDP invested in BERD (0.2%) and 5th in terms of the share of innovative firms (2009). One consequence of the limited investment in technological innovation is the almost non-existent, from a European perspective, patenting, with 0.43 patent applications per million habitants in 2008. Moreover, the RIM profile³ underlines that there has been a steep decline in private investment after 2008 that has reduced the already low levels of regional business R&D investments

¹ All data is sourced from Eurostat unless stated differently.

² Source: Observatory for Digital Greece (<http://www.observatory.gr>), "Internet Users in Greece" (2010).

³ <http://www.rim-europa.eu/index.cfm?q=p.baseline&r=GR23>

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.

In terms of human resources for science and technology (HRST), the region benefits from a relatively important (in the Greek context) share (6.1%) of the total researchers in the country (2005). This creates a potential for a structural shift towards a more knowledge intensive economy. The region is also ranked 4th in Greece in terms of the business R&D personnel (0.16% of the working population, 2009). More recent data is not available to judge whether there has been brain drain since the financial crisis.

According to Thomson Reuters data from 2010⁴, the scientific output of the University of Patras is particularly high, with a total of 4,989 publications over the period 2006-2010 (3rd rank among Greek universities, 12.3% of total) and 22,093 citations (4th rank, 12.4% of total). A third of these publications involved international co-authorship. The university is performing below the world average as regards the citation impact⁵, with a citation score of 0.87 over the same period. The University is mainly active in natural sciences (60% of its publications, 70% of citations, citation impact of 0.94) and engineering and technology (34% of publications, citation impact of 0.89). Even if the activity is low, the impact of the 81 publications in agricultural sciences is particularly high (1.41). As regards the Technical Education Institute of Patras, it is also particularly active in natural sciences and engineering and technology and achieves particularly high citation impacts (1.74 and 1.27 respectively), even if the number of publications is only of 82 over the period 2006-2010.

It appears that this scientific specialisation is in line with the industrial specialisation of the region. Based on an analysis from the European Cluster Observatory of the relative regional industrial specialisation compared to other regions within Europe⁶ the region is indeed relatively specialised in the sale, maintenance and repair of motorcycles and related parts and accessories, in sea and coastal water transport and in the growing of crops and mixed farming (see detailed table in Appendix F for an overview of the 20 industries in which the Ionian Islands are most specialised). However, the regions does not rank first for any of these industries in Europe.

In overall terms, the European Regional Innovation Scoreboard⁷ ranks Western Greece (grouped in the mega-region Kentriki Ellada) as a modest innovator (the lowest of four performance categories) along with all other Greek regions aside from At-

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).

⁷ MERIT & Technopolis 2012

tiki. 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, as would be expected, that innovation is mostly through integrating knowledge created elsewhere by purchasing ‘off-the-shelf’ technologies.

Moreover, both the (RIM) profile and a 2008 regional innovation strategy report commissioned by the management authorities, point to a limited demand of the majority of regional firms and scarce formal technology transfer mechanisms that would enable enterprises to exploit research results and knowledge produced in regionally located HEI's and research centres (or perhaps more importantly to assist local SMEs to source and absorb knowledge and technologies external to the region).

Figure 2 : SWOT of regional innovation potential and specialisation

Strengths	Weaknesses
<ul style="list-style-type: none"> • Above average level of public/HEI investment in R&D • Significant concentration of researchers and scientists at the HEIs and research centres • Significant transport and business infrastructure (industrial areas) and ‘gateway’ location conducive to attracting higher-value industries 	<ul style="list-style-type: none"> • Low levels of business investment in product development and technological innovation. • Limited capacity to absorb technological advances and new knowledge in regional enterprises • Mismatch between the scientific and research orientation of the HEI and the economic specialisation of the region
Opportunities	Threats
<ul style="list-style-type: none"> • Under-developed tourism potential • Cluster development still nascent • Shifting towards higher value added and speciality products in core regional industries 	<ul style="list-style-type: none"> • Possible brain drain of HRST due to crisis • Region has few distinctive sectors or fields of specialisations compared to rest of Greece. • Already low business investment in innovation and life-long learning weakened by the financial crisis.

Specific opportunities identified in the 2008 strategy report related to the current business specialisation pattern included:

- Changing dietary patterns and the general shift of consumers towards products of recognised quality and origin create opportunities for diversification in the local food industry and needs support from the public system of research and technological development.
- Utilisation of current trends in the tourism market to diversify and improve the tourism product through the use of innovation.

A recent analysis by Invest in Greece⁸ tends to confirm these potential areas (notably tourism and food and beverages) and adds several more, including: green energy and waste management, ICT and Life Sciences and fish farming (another mainstay of the regional economy where a new law liberalising the industry offers new opportunities for investment in an already successful sector of the economy).

However, attention needs to be paid not to invest in ‘white elephants’ in any sector (e.g. tourism) and to avoid jeopardising the development of one sector by that of another, notably from a sustainable development viewpoint (e.g. fish farming versus tourism or mass production versus natural and organic products).

In conclusion, the regional strengths and weaknesses appear to be broadly identified and relatively understood already. However, there is work to be done is on digging

⁸ <http://www.investingreece.gov.gr/default.asp?pid=127&nwslID=21&la=3&sec=6>

deeper into specific sectors to identify emerging clusters, exploring the potential for greater inter-sectoral co-operation (e.g. speciality food and drink products related to tourism networks, etc.) or cross-cutting technologies that could be applicable to more traditional business services.

Recommendations – specialisation and innovation focus

- The region of Western Greece has a number of clear opportunities to build on natural resource based, human capital and niche business and technology fields, some of which have been partly supported in previous programming periods. Western Greece, like a majority of other Greek regions, has a potential comparative advantage in focusing future research and innovation actions co-financed by the ERDF on maximising the potential of the ‘bio-economy’⁹, in line with the 2012 Commission strategy¹⁰.
- Create a number of thematic ‘industry innovation working groups with representatives from public-academic-business sectors (which should be ideally co-chaired by a senior regional government official and a business leader). These groups, with the support of experts studies where necessary, should set specific targets for their sector/cluster and analyse the sectoral innovation needs (see for instance, the Scottish industry leadership groups¹¹ model). Unspent ERDF technical assistance money should be allocated to provide sufficient resources for this process.
- Given the low rates of innovation, productivity and life-long learning, a priority should be given to considering alternative options for increasing the in-house ‘absorption’ capacity of regional firms in manufacturing or knowledge intensive service sectors through the creation of a graduate placement (innovation manager) scheme that would seek to stem a brain drain of graduates and encourage skilled engineers and specialists to return to the region.

2.2 The strengths and weaknesses of the regional innovation system

From the business innovation side, there are a small number of ‘companies of scale’ in terms of production capacity, that should be encouraged to work with their regional supply chains to upgrade production processes and value added content of products. There are also a few significant companies with R&D centres and some branch plants of multi-nationals (see Box 3). However, as noted above, overall business innovation capacity is limited in terms of product/service development, with most innovation taking place through technology acquisition.

The higher education and public research potential is important (see box 3 in section o). The current and potential scientific and technological specialisation of the higher education/public research sector and its fit with regional socio-economic priorities requires further clarification. In general, there is a potential for increased co-operation with regional businesses and some thematic matching ‘on paper’. The University of Patras, for instance, structures ‘intra-university thematic networks in four fields: Bio-medicine and Bio-engineering (fifteen networks), Environment and Sustainable Development (eight networks), Information and Communications Technology (eight networks), New Materials and Construction (six networks).

In terms of business infrastructure, three industrial zones, of which only two are operational, are established in Western Greece (see section o) and have achieved some critical mass. Moreover, two regional incubators have achieved a critical mass of high-

⁹ The bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products¹ and bioenergy. It includes agriculture, forestry, fisheries, food and pulp and paper production, as well as parts of chemical, biotechnological and energy industries. Its sectors have a strong innovation potential due to their use of a wide range of sciences (life sciences, agronomy, ecology, food science and social sciences), enabling and industrial technologies (biotechnology, nanotechnology, information and communication technologies (ICT), and engineering), and local and tacit knowledge.

¹⁰ http://ec.europa.eu/research/bioeconomy/press/press_packages/index_en.htm

¹¹ <http://www.scottish-enterprise.com/about-us/our-leadership/industry-leadership-groups.aspx>

tech innovative firms. Both the above offer incubator and one-stop-shop services to start-ups, SMEs, investors and other actors. Furthermore, knowledge transfer, entrepreneurial and innovation support services are provided by a good number of institutions, associations and projects; however, despite the efforts of such intermediaries the collaboration between innovation actors remains weak. Indeed, past or current projects like the Regional Innovation Pole of Western Greece and the Centre for the support of SMEs in Western Greece appear to have had limited impact.

Financial support to research and innovation comes from European programmes (EE FPs, ESA, etc) national programmes (GSRT) and a few regional programmes, absorbed mainly by universities and research organisations but industry is increasing its participation as well as their private investments. Both are very low compared to EU targets. Private funding for innovation is extremely limited with loan funding from commercial banks hard to obtain and no significant regional equity capital even from business angels (see section O).

Recommendations – regional innovation system

- The current range of intermediaries does not seem to be having a significant impact on the innovation potential and may be over costly to maintain. The region should examine the possibility of merging and or closing the existing publicly funded intermediaries and replacing them by a single regional innovation and enterprise agency drawing on good practice from elsewhere in the EU¹²). This agency could manage a global grant during the period 2014-20 to ensure a more cost-effective and co-ordinated service delivery in line with the RIS3 priorities.
- Financial support for investment is critical in the current context but international evidence suggests it is most effective when twinned with mentoring/coaching and manufacturing advisory services. As part of the design of the regional RIS3 strategy, a working group of financial professionals and business representatives should examine the potential for the creation of a regional ‘business finance’ network bringing together seed funding mechanisms in incubators or science parks, micro-credit, business angels, ‘development banks’ and co-investment funds. The aim should be to identify the most critical funding gaps/needs of regional firms and to set out a proposal for a more integrated response. Due attention should be paid to ‘educational and training activities’ on both the investor and investee (regional businesses) sides.

3. Stakeholder involvement and governance of research and innovation policies

3.1 Stakeholder involvement in strategy design and implementation

Despite the gradual decentralisation process and various initiatives aimed at structuring the regional policy system, the Western Greece governance process is not yet adequate to support a more systemic innovation potential. Regional innovation funding, both private and public, remains minimal; there is a limited tradition of co-operation innovation actors; and regional policy is not focused on creating synergies, networks, clusters, etc.

Box 1: A RIS3 process based on ‘systemic innovation’

Regional policy makers and stakeholders need to develop a capacity to assess the criteria upon which systemic innovation at the regional level is fostered. These include:

- The regional financial competence, both private and public, in the form of a regional ‘funding market’ in which SMEs can source easily funding opportunities, public co-financing or provision of loan guarantees, public procurement, tax credits, financial engineering (seed, venture and business angels) for innovation;
- The strength of co-operative culture: a quest for consensus would be expected to be stronger in regions

¹² www.oecd.org/innovation/policyplatform/48137719.pdf

with systemic innovation, whereas a competitive, individualistic, 'not invented here' mentality would be observed in regions where public-private and private-private interactions are weak;

- At the organisational level of the firm, systemic innovation would imply trustful labour relations, shop floor cooperation, mentoring, open transactions and knowledge exchange;
- Regarding the organisation of governance, embedded innovation will display inclusivity, monitoring, consultation, delegation and networking propensities among policy makers.

Source: based on Cooke, P. 'Regional Innovation Systems, Clusters, and the Knowledge Economy', *Industrial and Corporate Change*, 10.4, 957-961)

This situation partly reflects that in the previous (2000-06) and current (2007-13) programming periods, the planning and implementation of knowledge based development policies were managed in a top-down manner, primarily by the General Secretariat of Research and Technology (GSRT), and involved predominantly public organisations. Furthermore, only a few research and innovation actions were designed and implemented by the regional authorities (e.g. ERA-net and Interreg programmes).

In 2011 the Regional Authorities of Western Greece developed a three-year strategy and action plan. The strategy process included a public consultation via the Internet and through presentations to interested parties at a couple of events before formal adoption by the Regional Council. However, a formal process to involve all the stakeholders was not put in place and most of the stakeholders interviewed at the RIS3 meeting, organised by the Intermediate Managing Authority of Western Greece on 29 August 2012, were unaware of the document and of the engagement process. Representatives of four categories of organisations were present:

- From the business sector, the chair and vice-chair of the Chamber of Achaia and the chair of the Chamber Aitolokarnania;
- From academia, the rector and vice rector of the University of Patras, and the directors of three research institutes (ITYE, INBIS, and IEXMH)
- From technology intermediary organisations, the director of the Patras Science Park and the manager of the Patras InnoHub
- From the public administration, members of the Managing Authority and the Direction of Development Programmes of the Region.

The regional stakeholders are in favour of a more collaborative governance and decision-making. The Regional Authorities have declared that they will communicate the strategy document to as many stakeholders possible and will set up a process to receive and integrate their input. Moreover, all stakeholders expressed their interest, support, and strong commitment for participation in the RIS3 of Western Greece.

A series questions were raised concerning (1) the concept of smart specialisation, RIS3, and differences from previous innovation planning initiatives; (2) the (leading) role of the Regional Government and its plans for managing bottom-up participation; (3) whether RIS3 covers the entire Regional Development Programme of 2014-2020 or just innovation, entrepreneurship, digital economy and human resource measures and their share in regional development funds; (4) the time schedule and procedures of their participation, (5) concrete commitment for follow-up and next steps.

Stakeholders are aware that a different policy mix is necessary for driving innovation and knowledge-based development, and the bottom-up governance introduced by RIS3 was accepted extremely well from all. A novel element comes also from the Kallikratis reform and transfer of responsibilities for development programming to elected local authorities, which makes the Regional Council responsible for endorsing all plans, innovation and ICT included.

Stakeholders from research and technology institutions asked for a clear commitment from the IMA ensuring their involvement in RIS3 and smart specialisation strategy. Indeed, there was a wish to see an explicit partnership agreement that would reinforce their role. In return, the IMA made a clear commitment to foster participation and consultation with regional stakeholders, not only those present in the meeting.

3.2 Multi-level governance and synergies between policies and funding sources

In Western Greece, the planning for the 2014-20 development programme is at an early stage. The process started in April 2012 and it foresees (1) the formation and activation of development planning teams, (2) the organisation of a consultation at regional and sectoral levels to help prepare proposals (3) the formulation and submission of the first summary planning directions, and (4) preparing for active participation in the first national development conference, in November 2012.

A development planning team has been created within the Intermediary Managing Authority (IMA), and a first draft of guidelines for the regional development strategy will be submitted in September 2012. However, there is still no central guidance about key planning dimensions, such as an initial estimation of the overall budget and sources of funding, the structure of a future regional operational programme (ROP), the main thematic axis of the programme, etc.

Indeed, the first initiative to involve stakeholders in preparing the 2014-20 regional development programme was the meeting of the IMA staff, the DG REGIO RIS3 expert team, and regional stakeholders on 29 August. Synergies between different policies discussed during this meeting, included the relationship between funding for research and technology development and ‘daily needs’ and practical issues of local companies. Stakeholders placed an emphasis on support for ‘key enabling technologies’ and the need to distinguish between the competitive FP/Horizon funds and those that can be mobilised through a RIS3 via the Structural Funds. More information and good practice examples would be necessary to avoid making this issue a field of local tensions. Corallia provides a good example from the development of the micro-electronic cluster and the attraction of design centres of large global companies. Another focus of discussions was the ‘sustainability of actions’: self-sustaining clusters and technology support initiatives and the need for business models that secure a long term viability of actions.

3.3 Vision for the region

Regional authorities have been asked to design a 2014-20 development programme in the framework of the Europe 2020 strategy¹³, the Greek National Reform Programme¹⁴ and Memoranda of Economic Policy (Mnimonia)¹⁵. Moreover, the Greek regions (second level governments) have new responsibilities under the law 3852/2010 (Kallikratis reform). The regions are expected to draw up operational programmes based on their new responsibilities for economic planning and development, natural resources, energy, industry, jobs, trade, tourism, transport and communications, agriculture, livestock, fisheries, health, education, culture, sports, public works, planning and environment.

Given that Western Greece is one of the least developed Greek regions, a shift to policies that promote upgrading of the knowledge (technology) intensity of the public and private sectors is of major importance. Indeed, regional stakeholders argued, during the 29 August meeting, that there is a need for development scenarios based on innovation and skills that promote an outward looking development, and the creation of strong local technological advantages. The objective should be to both strengthen the capacity of the region to absorb technology (in the most general sense of the term to

¹³ http://ec.europa.eu/europe2020/europe-2020-in-a-nutshell/index_en.htm

¹⁴ Member States set individual national targets and the means for their achievement in the National Reform Programmes (NRPs) and a Stability/Convergence Programme, which are updated every three years and assessed annually by the Council. See: http://ec.europa.eu/europe2020/europe-2020-in-your-country/ellada/index_en.htm#content_2

¹⁵ The Memoranda (mnimonia) sets a series of targets for financial and structural reform. In particular, in the process of development planning should take account of the following desired structural changes and contribute to achieving them: enhancing capacity of the economy to produce, save and export, increase the efficiency and flexibility of product and labour markets, creating a more favourable business environment for domestic and foreign investors, modernisation of the public sector and public administration, restructuring and strengthening of the health system and social security programmes

include learning by doing not only hard technologies) and to become a ‘technology provider’ in selected fields.

Recommendations - Governance

- Regional innovation governance should promote systemic innovation and multi-level synergies in the public and private sectors
- The Regional Authority and the IMA of Western Greece needs to reinforce the framework for effective bottom-up strategic planning with the direct involvement of regional stakeholders. If the expertise is not available in house, then remaining technical assistance budgets should be used to mobilise experts that would support specific working groups of stakeholders.
- Rules of participation, roles and responsibilities of collaborative governance should be clearly defined as a matter of urgency.
- Initial estimations about the overall budget of the ROP and allocation in a limited number of priorities – research and innovation in particular – would be necessary at the start of RIS3

4. Towards a regional innovation and smart specialisation strategy

4.1 Regional research and innovation policy

The review of current policy orientations highlights a significant divergence between national and regional priorities for innovation policy, as well as between past and current priorities at the regional level. National priorities are aligned to Europe 2020 and its development, cohesion and sustainability priorities, while GSRT has aligned priorities with the EC’s FP7.

In contrast, the regional priorities are closer to identified economic challenges. The Regional Operational Programme (2012-2014) targets mainly existing (traditional) production sectors, whereas programmes in the recent past (Regional Innovation Pole, Integrated Strategic Plan for Innovation) were targeting emerging technology-intensive sectors.

Data from DG REGIO on expenditure during the 2000-2006 period and allocations for 2007-2013 provides an estimate of regionalised budgets. As can be seen from Appendix C, during the 2000-2006 period, the per capita investment in RTDI policies through the Structural Funds in Western Greece region was amongst the lowest in Greece and a majority was focused on innovation and technology transfer. A relatively small amount was spent on RTDI infrastructure compared to some other region regions. The per capita allocation for RTDI policies has increased in 2007-13 with a large absolute expenditure on research infrastructure and human potential for science and technology. Whether in practice, these allocations have been respected is difficult to assess without further data on actual expenditure. Data from DG REGIO (as of September 2012) suggest that the OP for Western Greece - Peloponnesus - Ionian islands had a below average level of ERDF expenditure at 36% (40% nationally). However, in terms of actual expenditure, data from the GSRT (see Appendix D) on funding provided to entities (businesses and universities) for R&D and innovation projects under the national OP for Competitiveness suggest that the total project budgets (to September 2012) amounted to only € 31,750,037, of which €23m for enterprises and just under €9m for the university sector.

In general, the expert team consider that the past failures of the regional innovation policy were mainly due to a focus on creating technology intermediary organisations and not enough attention to leveraging capabilities in the private sector to absorb knowledge and undertake product and service innovation. Indeed, most of the innovation networks or projects funded did not survive in the long run and the capacity to design and deliver innovation policy at the regional level remains weak.

Figure 3 Current and future main regional priorities

Policy document	Identified priorities; objectives, targets and goals
<p>1st Directive for Setting the Development Programme 2014-2020</p> <p>Υπουργείο Ανάπτυξης, Ανταγωνιστικότητας και Ναυτιλίας (2012) 1η Εγκύκλιος Σχεδιασμού και Κατάρτισης Αναπτυξιακού Προγραμματισμού 2014-2020</p>	<ul style="list-style-type: none"> • Reinforcement of the knowledge society and upgrading the education system, with emphasis on skills and lifelong learning, • Improving the competitiveness at all scales, national, regional, local • Strengthening research, technological development and innovation • Increase access and use of information and communication technologies, • Development of the productive sectors of the country, with emphasis on strengthening the competitiveness of SMEs, • Development of endogenous potential for investment financing and the wide attraction of foreign direct investment • Emphasis on spatial approach (place-based), community-led local development, integrated local development strategies.
<p>Proposal of GSRT for Defining Directions of Development Strategy 2014-2020</p> <p>ΓΓΕΤ (2012) Πρόταση ΓΓΕΤ για τη Διαμόρφωση Κατευθύνσεων Αναπτυξιακής Στρατηγικής 2014-2020</p>	<p>Five priorities and policy axis 2007-13; proposed also for 2014-2020</p> <ul style="list-style-type: none"> • Research Excellence, focusing on support of human resources and research infrastructures • Connection of research and production, focusing on PPPs among academic and business organisations; strong incentives for spectacular turn of the private sector to research and innovation; support to dissemination and exploitation of Key Enabling Technologies; support to creation of innovative companies, competence centres and risk sharing financing • Outward looking and synergies to Horizon 2000 and international research organisations • Science and society, dissemination of research results, research models for media, and business culture • Support to research of technological development and innovation policy
<p>Operational Programme of the Region of Western Greece (2012-14)</p> <p>Περιφέρεια Δυτικής Ελλάδος (2011) Τριετές Επιχειρησιακό Πρόγραμμα Περιφέρειας Δυτικής Ελλάδος</p>	<p>The overall development objective is to utilise the geographic position of the region and its comparative advantages to overcome the problems of unemployment and inter-regional inequality. In particular, the priorities for a new production model were:</p> <ul style="list-style-type: none"> • Restructuring of productive sectors towards higher value-added services incorporating the developments in technological progress and innovation, • Development high level of synergies between the three production sectors, • Promoting entrepreneurship with dominant export orientation, • Promotion of the knowledge economy, • Mobilising endogenous resources and attracting foreign investment.
<p>Regional Innovation Pole of Western Greece (2006-2008)</p> <p>ΓΓΕΤ (2009) Περιφερειακός Πόλος Καινοτομίας Δ. Ελλάδος</p>	<p>Thematic Priority I: Information and Communication Technologies</p> <ul style="list-style-type: none"> • Information Technology - Telecommunications: Security of computer systems and networking s. Embedded computing, telecommunications and control systems. Interactive services for citizen service. IT and telecommunications (broadband). • Transport: International multimodal transport. <p>Thematic Priority II: Food Safety and Technology</p> <ul style="list-style-type: none"> • Certification main competitive agricultural, livestock, and fishery products. • Technologies and food quality. Quality of agricultural products and fish farming-crops. <p>Thematic Priority III: Environmental Management and Protection</p> <ul style="list-style-type: none"> • Clean and renewable energy • Energy-saving technologies in buildings • Conserve natural resources by using new advanced materials • Manage infrastructure and environmental impacts • Management and recovery of waste
<p>Integrated Strategic Plan for Innovation in the Region of Western Greece (2008)</p> <p>Περιφέρεια Δυτικής Ελλάδος (2008) Ολοκληρωμένο Στρατηγικό Σχέδιο για την Καινοτομία στην Περιφέρεια Δυτικής Ελλάδος</p>	<p>Priority 1. Reorientation of the productive</p> <ul style="list-style-type: none"> • Creation of spin-off • Innovation Awards for students • Viewing the Region as a place to invest high value added <p>Priority 2. Developing innovative capacity in companies</p> <ul style="list-style-type: none"> • Voucher for innovation • Developing human capital for business • Management training in innovation <p>Priority 3. Realising the research potential of the region</p> <ul style="list-style-type: none"> • Developing technology transfer offices • Business Research collaborations with research institutions in the Region <p>Priority 4. Development of dialogue among the actors of the innovation system</p> <ul style="list-style-type: none"> • Creating a Regional Innovation Board

At the present time, the evidence suggests that there are not sufficient mechanisms in place to stimulate private R&D investments or to foster the innovation capabilities of SMEs, through the diffusion and adaptation of technologies (notably key enabling technologies). Eco-innovation is essentially tackled through support for energy efficiency. The question of improvements of demand-side conditions and especially public procurement as a driver for innovation are not yet addressed.

4.2 Cluster and entrepreneurship policies

In Western Greece, most of the core sectors (see box 2) are not connected to the regional innovation system and with the exception of a few cases there are no collaboration schemes or facilitators or associations active.

Overall, **sector-specific support services/schemes** have been only partially deployed and tested in the region. Rather, the policy has focused on mainly horizontal and multi sector support projects/policies, like the Regional Innovation Pole of Western Greece that had limited impact. Policies in favour of the formation of a critical mass of firms, sectoral associations, etc, have not being pursued in any sector, including the traditional ones.

One mature innovation **cluster** (mi-Cluster) and two emerging clusters (Hydrogen-Fuel Cells, PV Smart Installing) have being formed and are coordinated by three Cluster Facilitators/Initiatives (Corallia Clusters Initiative, Patras Science Park, and University of Patras respectively). Cluster policies similarly have not being designed at regional level and the establishment of innovation clusters in the region was rather the result of nationally designed programmes than regional policies.

Box 2: Clusters - size, specialisation and focus in Western Greece

Size¹⁶, Specialisation¹⁷ and Focus¹⁸ in Western Greece is mainly around *Farming and Animal Husbandry* (with 75% of fish, shellfish and crustaceans exported), *Agricultural Products* (ranked according to export volumes as follows: strawberries, peaches, cotton, olive oil, olives, tobacco, grapes, oranges) and *Tobacco* with 2 stars in the Cluster Observatory star system. Around 30% of the regional population is employed in these sectors. *Maritime* and *Construction* are also sectors with significant activity gaining a 1 star in the Cluster Observatory ranking. Other noteworthy sectors are *Tourism* (especially in the axis Ancient Olympia-Katakolo) and *Processed food and Transportation and Logistics*.

During the 29 August 2012 meeting, the IMA of Western Greece stated their intention to implement cluster policy measure for the sectors with a competitive advantage, including fisheries, agricultural production (strawberries, peaches, cotton, olive oil, olives, tobacco, and grapes) shifting towards organic and added-value products, tourism in the axis Katakolo-Ancient Olympia and high-tech sectors like microelectronics and photovoltaics/energy. The Region of Western Greece will study the basis for implementing the cluster policy developed by the GSRT/Corallia and adopt a methodology to develop and promote clusters.

¹⁶ 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.

¹⁷ 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.

¹⁸ 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.

Box 3: Clusters and Cluster Actors in Western Greece.

Mature Cluster:

ICT: The Nano/Microelectronics based Systems and Applications Cluster (mi-Cluster), is the first innovation cluster in Greece with a pole of concentration in Western Greece. Since its establishment in 2006, it demonstrates continuous growth. Today, the mi-Cluster consists of more than 130 members including innovative start-ups, small, medium and large companies, academic labs and research institutes, science parks, networks, associations, suppliers of services, financial institutions, media of different kinds, national ministries and regional agencies involved in industry, regional, science and technology development and policy. The Corallia Clusters Initiative as a coordinator in collaboration with the Association of high-tech Industries of Western Greece, GSRT, the Region of Western Greece and other organisations that enhance innovation, have been instrumental in the mi-Cluster's development. The mi-Cluster has 30 members concentrated in Western Greece, most of them co-located in the Patras InnoHub and the Patras Science Park. Members in Western Greece: Accusonus, Analogies, Bluedev, Bytemobile acquired by Citrix, Dialog, Diaplous, Digital Sky, Dynesys, Econais, Infisensis, Intracom, Irida, Nanoradio acquired by Samsung, Noesis, Sciensis, ThinkSilicon, Thyratron, R.C. Athena/ISI, Upatras/APELab, Upatras/WCLab, Upatras/ELLab, Upatras VLSILab, Upatras/Comes Lab, Upatras/HPCLab, Upatras/Comsystems Lab, Upatras/Micro Lab, TEI Messolonghi/Tesyd, Tei Patra, PSP, Corallia. More at <http://www.mi-cluster.gr/>

Emerging Clusters:

Energy (Hydrogen-Fuel Cells, PV Smart Installing), Farming and Animal Husbandry (Fisheries), Agricultural Products, Tourism.

Leading and noteworthy Businesses:

Companies with significant R&D centres include: Citrix, Samsung, Dialog, Intracom, etc. Companies with sizeable production capacity are: Pettas, Loux, Couniniotis, Mills Kепенos, Gaea, Sollar Hellas, Ideal Bikes, Friesland Campina, Athenian Brewery, etc. Spin-offs from the University of Patras and FORTH/ICE-HT are: Advent Technologies, Analogies, BEM S&S, ENBIO, ELDRUG, HELBIO, Eyelead Software, Nanothinx, Impermeable.

Key Research Actors: The research fabric is mainly composed of four public Universities (University of Patras, University of Western Greece, the Open University and the Department of the University of Ioannina in Agrinio), two Technological Educational Institutes (TEI of Patras and TEI of Messolonghi), three Research Institutes (Computer Technology Institute, Industrial Systems Institute, Institute of Chemical Engineering Sciences) and the Regional University Hospital in Rio.

Local business angel, seed and venture capital providers:

None

Principal Intermediaries:

The Patras Science Park, the Patras InnoHub/Corallia, the Industrial Zones administrations, the Industrial Association of Western Greece and Peloponnese, the Commercial Chambers of Achaia, Iliia and Aitoloakarnania, the Association of high-tech Industries of Western Greece, the Patras Business Innovation Centre, the Universities' Liaison Offices, etc.

Entrepreneurial and Innovation Support Services (kind of **one-stop-shops**) have been underpinned in Western Greece by a number of institutions, incubators, associations or projects: The Patras Science Park, the Patras InnoHub/Corallia, the Industrial Zones administrations, the Industrial Association of Western Greece and Peloponnese, the Commercial Chambers of Achaia, Iliia and Aitoloakarnania, the Association of high-tech Industries of Western Greece, the Patras Business Innovation Centre, the Universities' Liaison Offices, etc. The Centre for the support of SMEs in Western Greece coordinated by the Patras BIC had limited impact. Despite the efforts of intermediaries the collaboration between innovation actors is limited.

The Patras Science Park and the Patras InnoHub/Corallia are two of the **incubators** in Western Greece that have achieved a good critical mass of high-tech innovative firms; the former in more than one sectors (Energy, ICT, etc) and the latter being the only monothematic infrastructure (ICT) in the region constructed and operated under a very innovative scheme that resembles a public-private partnership. Both the above offer incubator and one-stop-shop services to startups, SMEs, investors and other actors. Policies for their development has being designed and funding has being fun-

nelled centrally and not by the regional authorities. Furthermore, three Industrial Zones are established in Western Greece (Patras Industrial Zone, Astakos Marine Industrial Zone, and Glafkos Small-Industries Zone) of which only two are operational; they have achieved some critical mass and are not sector specific.

Last but not least, seed and venture capital investors are almost non-existent in Western Greece. A few business angels have made a handful of small investments. The commercial banks mainly offer standard loans but even those are now scarce due to the financial crisis.

Recommendations

Our recommendations for the RIS3 are: (1) use recent cluster mapping data and techniques to identify regional competences and assets; (2) support and consult existing clusters to meet the objectives of smart specialisation; (3) replicate an effective industrial cluster development approach to facilitate the rapid spread of good practice and ideas; (4) seek and provide advice on what methodology to use to develop clusters, and consider the creation of a cluster secretariat; (5) strengthen the cooperation of existing clusters to make connections to local, national and global value chains; (6) facilitate cross-clustering and the identification of innovation opportunities at the interface between different clusters; (7) create specialised one-stop-shops for the regional specialisations and competences, preferably within existing structures to support mainly SMEs; (8) develop further, incubators and accelerators that provide wide range of services including training, business angel networks, etc, (9) ensure a qualitative upgrade of the tourism sector to develop the alternative types of tourism (eco-tourism). Specific funding measures and support should be developed aimed at tourism innovation and inter-linkages with other productive sectors (bio-agro-food, ICT, etc.); (10) seek to enhance the competitiveness of SMEs in the agricultural and fisheries sectors where aquaculture could be a key objective of the rural development policy; (11) deploy incentives for the fishing sector to restructure fishing organisations, producers' organisations and other stakeholders; (12) ensure that support in rural areas is directed to young people for business start-ups in the agro-food/forestry sector.

4.3 Digital economy and ICT policies

Western Greece has both a reasonable infrastructure and level of human resources to allow it implement e-government initiatives and regional administrative reforms. The use of ICT to address specific targets, such as the improvement of broadband access to reduce the digital divide, will enhance the ability the region to save resources, to make more rational use of investment, and improve the quality of services for citizens and businesses. Furthermore, ICT can be used to enhance competitiveness, through the modernisation of production capacity and foster innovation.

The main regional ICT priorities are: (1) development of eGovernment via digital public infrastructure, (2) integration of ICT in public administration reform, (3), promotion of broadband infrastructures, (4) reduction of operating expenses of the public sector, (5) enhancement of electronic transactions with citizens and businesses in the public sector, (6) strengthening of new entrepreneurship, (7) strengthening the competitiveness of enterprises through ICT.

The regional authorities, during the meeting with the expert team, stated that Green ICT development is a catalyst for improving the efficiency of other sectors. In particular, the next generation access networks (NGA) are expected to have a positive impact on green growth sectors (sectors contributing most to the production and emission of greenhouse gases), such as energy, transportation, buildings, etc. The aim is to support (a) large organisations / companies and public sector in the consolidation of their computing and storage needs through the creation of energy-efficient computing centres (Green Centres), (b) smaller businesses and citizens to "assign" their computing needs to the "cloud," (c) energy providers for the use of next generation networks to monitor, manage and control the distribution of energy, (d) new collaborative methods using next generation networks to reduce transport needs (tele-working, tele-medicine, remote assistance at home, etc.) (e) use of ICT for vehicle traffic and fleet management (f) the use of ICT for remote management of buildings and reduce energy consumption, and (g) the use of ICT for instant recognition and disaster response.

4.3.1 Broadband infrastructure and NGA networks

The development and expansion of metropolitan fibre optic networks and the promotion of advanced broadband in rural areas is a national priority. The current OP Information Society, has funded the development of broadband infrastructure in Western Greece by creating fibre-optic metropolitan access networks (MAN) in eight municipalities: Patras (and Rio), Aigio, Pyrgos, Amaliada, Nafpaktos, Agrinio Messolonghi Oiniades. This fibre-optic infrastructure forms a total network of 176,996 km¹⁹ and interconnects a total of 189 public service, 184 education-research, 31 health-welfare, 30 cultural-sporting and 12 other entities, or a total of 446 access points.

Secondly, the Greek School Network²⁰ connects 422 access points in educational institutes while the number of points covered by the MANs is 184. There is a potential to extend the MAN to 238 educational points in the eight municipalities.

Thirdly, the local universities, technological educational institutions and research centres are served by GRNET (the Greek Research and Technology network), via dedicated fibre lines that provide advanced IP connectivity and flexible cloud-based computing services.

At regional level, a specific focus is placed on the development of broadband networks (fibre, wireless networks and related technologies) that provide a new infrastructure required to realise the socio-economic potential of the urban centres and sub-regions. A number of specific national initiatives intervene in favour of regional infrastructure:

- To facilitate the utilisation of the Metropolitan Fibre Optic Networks – MANs. An open Tender for the selection of a contractor for the project 'Integrating Rings Metropolitan (MAN) with National Networks' (Invitation 33 of OP "Digital Convergence" budget €7 million), has been issued.
- To expand the metropolitan fibre optic networks and the wireless networks, to extend their coverage through synergies with other infrastructures (Syzefxis²¹, school-net, etc). SYZEFXIS will be used extend to 112 additional points, by exploiting the existing MAN in the eight Western Greece municipalities
- To promote the use of fibre optic and wireless networks for providing Internet access and coverage of remote and mountainous areas. Recently, Invitation 34 of OP "Digital Convergence" has been published, with a national budget of €201.5m, allocated to extend high-speed Internet services to rural 'white' areas.

4.3.2 E-services

A series of platforms and application have already been developed offering innovative e-services, such as the "Basket of goods in the Region" an initiative undertaken by the Ministry of Rural Development and Food (MRDF) in all the regions of Greece. In Western Greece the basket of products is based on three inter-linked topics: identity - quality - sustainability as an innovative approach to creating competitive dietary patterns. The specific objectives of the Western Greece basket of products include:

- The promotion of regional products and the establishment of a regional brand;
- The promotion of sustainable growth through organic farming and integrated management of primary production
- The conservation and protection of biodiversity through the protection and strengthening of local and traditional varieties of crops and livestock

¹⁹ A total of 101,963 km in Achaia, 50,771 km in Aitoloakarnania, and 24,232 km in Ilia.

²⁰ The Greek School Network (<http://www.sch.gr>) is the educational intranet of the Ministry of Education, Culture and Sport (<http://www.minedu.gov.gr>), which interconnects all schools and provides basic and advanced telematics services.

²¹ The "SYZEFXIS" (<http://www.syzefxis.gov.gr>) project of the Ministry of Public Reform and eGovernment, seeks to aggregate and improve telecom services of the entire public sector.

- Better connection of local products with other sectors, such as tourism
- Increased presence of these products in the domestic and international markets
- The certification of the quality of local products

This project is expected to lay the groundwork to develop an online platform for electronic transactions between producers (B2B) and / or processors and customers - consumers of the food chain in Greece but particularly from abroad. The aim is not only to promote local products but provide interactive tools for both consumers seeking information (creating a bidirectional exchange of information) about the product and gather consumer preferences and opinions on product, which when properly interpreted can feed into product improvement processes.

A number of other projects are also underway around the themes of tourism and product promotion. One aims to create a single platform for tourism and culture (Design and Development Platform iWesternGr, implemented under the OP Digital Convergence) through applications of augmented reality and QR tag reading applications for mobile devices, which will provide a single point of access to information for citizens and visitors. However, there are also similar projects under Priority Axis 04 "Digital Convergence and Entrepreneurship in Western Greece" (Thematic Priority 13) of the Regional Operational Programme of Western Greece - Peloponnesus - Ionian Islands 2007-13) which also aim to support online shopping for Western Greece products

In short, eservice development is currently focused on a number of online platform projects aimed at promoting a regional product, tourism and cultural branding and improving bidirectional flows of information between consumers, producers, etc. The fact that most funding is nationally distributed leads to a risk of a duplication of effort in terms of projects funded through the ROP and a lack of coherence with regional priorities (e.g. to promote emerging clusters via such platforms, using platforms for gathering and disseminating strategic intelligence for traditional sectors, etc.).

4.3.3 Ensuring investments in e-government

For the proper and effective operation of the public administration, the RWG has already taken the following actions:

- Interventions to strengthen management capabilities at the levels of public action planning and operations of the Region
- Strengthen the provision of accurate information and friendly services to citizens of Western Greece
- Utilisation of ICT in the organisation structures, human resources, etc.
- Training of staff on critical aspects of National and European legislation, project management, skill and knowledge certification etc.

The region possesses significant experience in the management of EU and other development projects, for the design, implementation and promotion of eGovernment services. However, the regulatory framework that includes complex, ambiguous, inconsistent, and obsolete regulations is hampering the implementation of e-government, so there are significant delays in the implementation of projects and disbursement of funds. In particular, the implementation of the Law 3979/2011 on eGovernment has to be a major priority for the RWG, with the following objectives:

- to simplify operating procedures, resulting in a drastic reduction of the administrative burden for citizens and businesses in their relation with RWG.
- To reduce corruption incidents, and establish relationships of trust between citizens, businesses and public sector bodies.

Moreover, RWG intends to provide support in major horizontal projects aimed at monitoring the national budget, the Electronic Recording of Public Property (all the public properties), the electronic public procurement, Digital Forest Maps, Digital

Cadastre, Archaeological Cadastre, etc. already underway with the financing of the Operational Programme "Digital Convergence".

Recommendations on digital economy

The Region of Western Greece should:

- Ensure there is a co-ordinated strategy put in place to utilise optimally the developed public broadband infrastructure at a regional level. .
- Undertake an inventory of projects and ‘meta-analysis’ to ensure that the projects funded in the next period build on investments in the current period in a more structured framework
- Ensure that all projects developed comply with the obligation of interoperability²² in line with national and European guidelines²³ and standards²⁴.
- Give a priority to the adoption and use of open source platforms (software)²⁵ in order to manage available resources in a fair, transparent and cost effective way. The use of open source software enables the further development of software and applications, thereby offering public organisations a set of economic, reusable tools and resources that can contribute to innovation and entrepreneurship²⁶.
- Stimulate an active involvement of the private sector in the delivery of ICT products & services through PPPs and the use of innovation business models for the delivery of private services over public infrastructure. In particular, the private sector should be encouraged to play a leading role in promoting and adopting green ICT solutions to minimise energy and ICT waste management costs.

According to the preliminary strategic directions of the Region²⁷, 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, and aquaculture 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.

²² Interoperability includes: A predefined information format (information models and metadata); a default mode for the exchange of information (communication protocols); a default data access mode; a default mode for searching the data (metadata technologies, catalogues, etc.)

²³ The Greek e-Governance Framework (Plaisio Ilektronikis Diakyvernisis, PID) is part of the overall public IT architecture serving enterprises and citizens. and the national version of the European Interoperability Framework, is the cornerstone for the creation of a Greek Digital Agenda. Interoperability, based on the European Action Plan 2011-2015 (ICT for Government and Public Services - Action plan 2011-2015) is a first priority since it is a necessary condition for the implementation of cross-border electronic services.

²⁴ The main features allowing interfacing with other subsystems include (a) the provision of web services based on international standards (SOAP, UDDI, WSDL, etc.) (b) a workflow design based on international standards (XPDL, BPML, etc.). In addition, all projects should create appropriate metadata in line with the Greek Interoperability Framework (e-GIF) and the specifications of public administration portals.

²⁵ The adoption of open source platforms is encouraged by both the European Commission (http://ec.europa.eu/dgs/informatics/oss_tech/index_en.htm) and national strategies (e.g. www.ellak.gr) for e-government, as well as through actions like Interreg IVC - "OSEPA" <http://osepa.eu/> etc.

²⁶ See <http://www.flossimpact.eu>

²⁷ “Πρόταση της Περιφέρειας Δυτικής Ελλάδας για τη Διαμόρφωση Κατευθύνσεων Εθνικής Αναπτυξιακής Στρατηγικής για την Περίοδο 2014-2020”, Περιφέρεια Δυτικής Ελλάδας, 2012.

Transportation: the cost and the time spent on transportation for citizens and enterprises is enormous. Modern smart transportation approaches, based on ICT, should be deployed, to minimise the cost of travelling, reduce the consumption of fossil fuels, and improve the efficiency of businesses.

Health: health services are beyond reach for several citizens, because of the rising costs and the limited capacity of the traditional public health system. This problem can be partially solved by using new cost-efficient 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, under a proper sustainability model.

Manufacturing: this sector, suffering from reduced demand and low-cost imports, needs to be supported by ICT, in getting better automation, control and monitoring. Cost minimisation and quality assurance can help restrain job losses and bring about new investment.

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

Education: the education system of the Region should be supported in a way to (a) improve the ICT skills level of the citizens and (b) enhance the ability of higher education institutions and research centres to carry out applied research for innovative products and services.

e-government and learning: the cost of dealing with the regional public services is significant 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 for those with low IT skills.

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 fibre to each hosted enterprise. The same can be done for selected urban neighbourhoods, by connecting the respective households with a passive “open-access” FttH local network. 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.

Furthermore, the Region should seek to encourage a substantial private sector involvement in the full project cycle and risk sharing. This can be best carried out by flexible PPPs, or by ICT vouchers for selected households or SMEs. Regarding other specific RIS3 Strategy ICT-related requirements:

- There is no master plan for e-government services since most (cadastre, e-prescription, e-invoicing, etc) are administered by national authorities. However, e-services like local taxation or regional permits may be administered regionally. All e-government services should adhere to well-defined interoperability standards, and be based on dependable cloud computing platforms²⁸.
- There is no reference to plans for the deployment of new and the extension of existing NGA networks.
- An operational inventory of ICT infrastructure should be created.
- 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.

²⁸ http://ec.europa.eu/information_society/activities/cloudcomputing/docs/com/com_cloud.pdf

- 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

Monitoring refers to the need of verifying the state of implementation of activities. Evaluation refers to assessing whether and how strategic goals are met. In order to perform evaluation, it is essential that objectives are clearly defined in a RIS3 in measurable terms. A central task during the design phase of the RIS3 is to identify a limited yet comprehensive set of output and results indicators and to establish target values for each of them.

As noted above, at the present time, there is apparently no specific institution or group of experts, etc. tasked with monitoring in more depth and analysing the innovation, cluster or ICT potential of the region. One option might be to fund doctoral and post-graduate research into innovation potential and activities. This would be a relatively low-cost way of developing know-how and creating a group of specialists better able to support policy making processes. This could be done eventually on an inter-regional basis for several Greek regions, pooling expertise and know-how.

Guidance on evaluation methodologies for innovation measures is already available for the 2014-20 period²⁹ 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.

²⁹ See: <http://bit.ly/Igzx5T>

Appendix A List of people interviewed

Regional Administration of Western Greece

- E. Georgiou, Intermediate Managing Authority
- N. Thomopoulos, Intermediate Managing Authority
- L. Stamatelatos, Department of Development and Planning
- S. Papaspirou, Department of Development and Planning
- P. Ganos, Department of Development and Planning

Business sector

- T. Tsoumpelis, Chamber of Achaia
- K. Nikoloutdos, Chamber of Ileia
- G. Marlafekas, Loux S.A.

Academia - Research

- G. Panagiotakis, Rector, University of Patras
- D. Kalpaxis, University of Patras
- A.Koskeris, ITYE
- K. Galiotis, ITE / IEXMH
- G. Konstantinidis, ITE / IEXMH

Technology Intermediary Organisations

- G. Mentzelopoulos, Science Park of Patras
- D. Papailiou, Corallia Clusters Initiative

Appendix B Key documents and references

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ΓΓΕΤ (2009) Περιφερειακός Πόλος Καινοτομίας Δυτικής Ελλάδος (Regional Innovation Pole of Western Greece).

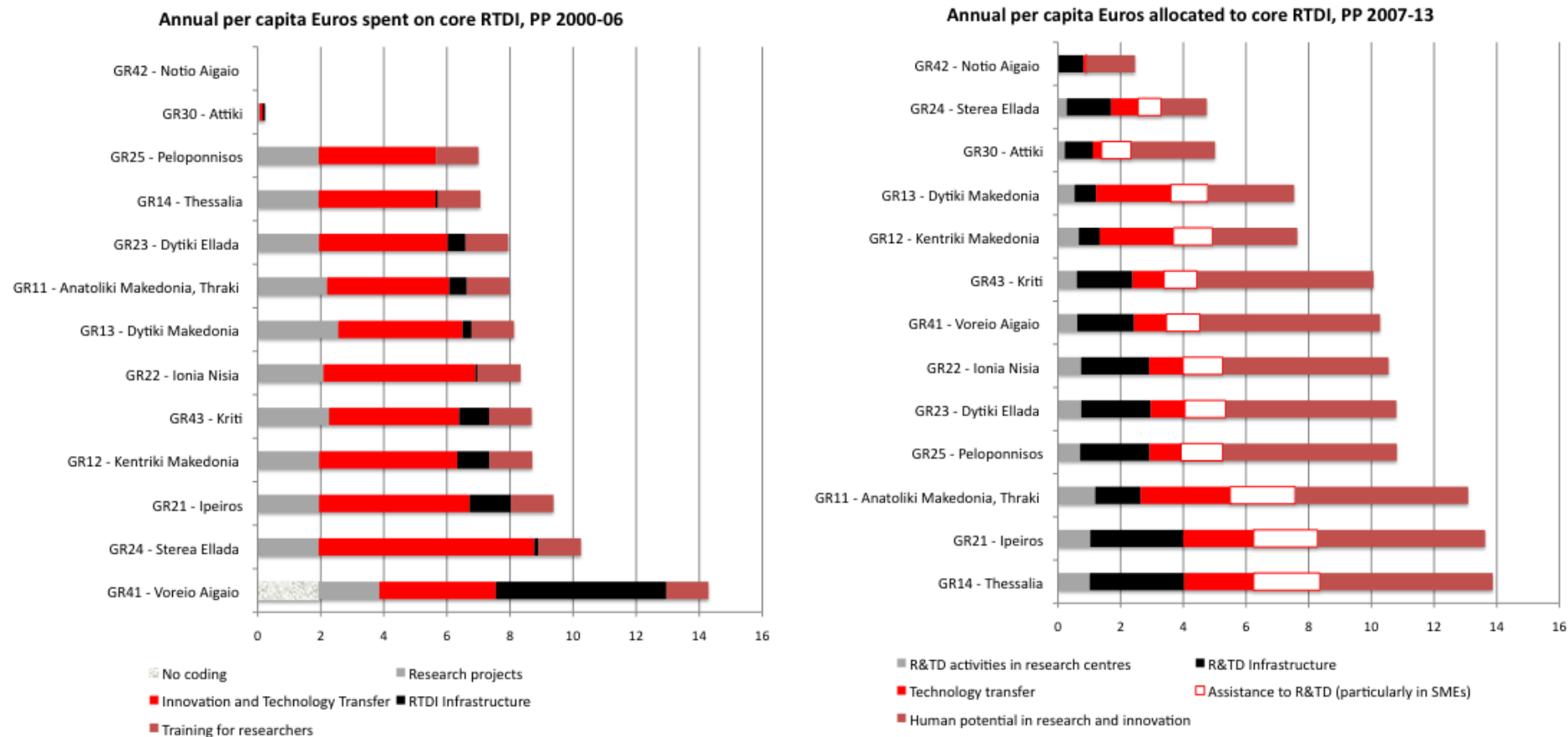
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Regional Innovation Monitor (2012), <http://www.rim-europa.eu/index.cfm?q=p.baseline&r=GR23>

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

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

Appendix C Estimated Structural Fund allocation for RTDI per Greek region



Source: Data DG REGIO. Calculations: Technopolis Group. The total for each region includes the amounts allocated via the Regional Operational Programmes plus the expenditures and allocations regionalised on a per capita basis in the case of the national, cross-border or transnational OPs. DG REGIO developed the regionalised data-sets.

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
Attica	€ 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%
Central Greece	€ 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 – Western Greece

% of Total Gross value added at basic prices	2005	2006	2007	2008	2009
A - Agriculture, forestry and fishing	10.75	8.33	8.30	7.14	7.32
B-E - Industry (except construction)	10.83	13.44	12.68	11.10	11.79
C - Manufacturing	8.98	10.94	10.96	9.32	9.25
F - Construction	9.54	10.97	9.30	8.14	8.06
G-I - Wholesale and retail trade, transport, accommodation and food service activities	26.67	26.52	27.43	30.26	25.62
J - Information and communication	2.37	2.61	2.70	2.98	2.89
K - Financial and insurance activities	3.07	2.99	2.81	2.60	2.89
L - Real estate activities	9.62	9.14	9.83	10.66	11.31
M_N - Professional, scientific and technical activities; administrative and support service activities	2.66	2.77	2.95	2.94	3.07
O-Q - Public administration, defence, education, human health and social work activities	19.21	18.06	19.22	20.23	22.07
R-U - Arts, entertainment and recreation; other service activities; activities of household & extra-territorial organisations and bodies	5.27	5.18	4.78	3.97	4.98
TOTAL - All NACE activities - in Millions of Euros	8,703.6	9,188.2	9,463.9	9,724.1	9,507.2

Source: Eurostat

Appendix F Relative regional specialisation in 20 industries – Western Greece

	Industry	Rank in Europe	Specialisation	Employment
1	Sale, maintenance and repair of motorcycles and related parts and accessories	3	5.25	804
2	Sea and coastal water transport	8	8.20	2 338
3	Growing of crops combined with farming of animals (mixed farming)	9	2.69	11 251
4	Growing of crops; market gardening; horticulture	10	9.69	42 122
5	Provision of services to the community as a whole	11	2.75	9 665
6	Adult and other education	12	2.44	4 561
7	Bars	14	2.65	7 333
8	Site preparation	17	2.76	2 219
9	Repair of personal and household goods	17	2.28	812
10	Fishing, fish farming and related service activities	19	4.47	991
11	Manufacture of non-refractory ceramic goods other than for construction purposes; manufacture of refractory ceramic products	20	2.66	738
12	Manufacture of cement, lime and plaster	20	4.75	573
13	Cutting, shaping and finishing of ornamental and building stone	20	3.01	915
14	Activities of households as employers of domestic staff	21	2.19	2 966
15	Farming of animals	22	3.02	4 144
16	Manufacture of other food products	23	1.63	4 964
17	Secondary education	23	2.19	9 271
18	Collection, purification and distribution of water	37	1.97	1 140
19	Other computer related activities	37	1.51	553

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