Operational Programme for Competitiveness, Entrepreneurship and Innovation and National RIS3 Strategy: Consistency analysis

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In order to advise whether the Operational Programme for Competitiveness, Entrepreneurship and Innovation 2014-2020 (EPANEK) is consistent with the national Research and Innovation Strategy for Smart Specialisation, we have examined comparatively the:

- The Operational Programme under the investment for growth and jobs goal "Competitiveness, Entrepreneurship and Innovation 2014-2020" and its three annexes A, B, C (version v15-Version8)
- The ex-ante evaluation of EPANEK
- The 140721_TEP_Epixeirimatikotita_2014-2020
- The National Strategic Framework for Research and Innovation 2014-2020 (Summary Text of Consultation, final_4).

The issues that were analysed address the following questions:
(a) Are the analysis in the OP EPANEK and its research / innovation / digital growth related result and output indicators and targets consistent with the results of the RIS3 SWOT or other analysis?

(b) Are the research / innovation / digital growth priority axis and description of the actions in the OP consistent with the RIS3 specialisation fields and policy mix (including possible horizontal / generic support measures)?

(c) Are innovation-related support actions in the OP EPANEK under investment priorities 1a, 1b, 2b or 2c that are NOT consistent with the RIS3? If relevant: Are there any innovation-related actions that do not fall under investment priorities 1a, 1b, 2b or 2c (but for instance IP3 SME competitiveness or IP4 energy and eco-innovation) and are they consistent with the RIS3?

(d) What percentage of the budget for the research / innovation / digital growth priority axis goes into horizontal / generic support actions and which is targeted exclusively at the RIS3 specialisation fields? Is the OP budget consistent with the RIS3 indicative budget planning / information?

1. Research, innovation and digital growth action in EPANEK 2014-2020

Research, innovation and digital growth actions and results of EPANEK 2014-2020 are to be found into two priority axis:

Priority Axis 1: Developing entrepreneurship with sectoral priorities

EU support in Euro	% OP	Thematic Objective	Investment Priority	Specific Objective	Results indicators
661.231.214	18,13%	1	1b	1.1. Increase of business initiatives and partnerships to develop innovative entrepreneurship in accordance with national RIS3	Business R&D as % of GDP: from 0,24 (2011) to 0,38 (2023)
160.000.000	4,39%	2	2b	1.2. Increase the supply of digital services, applications and integrated ICT solutions for business	Number of SMEs and large companies active in e-commerce: from 1500 (2011) to 3000 (2023)

Priority Axis 3: Developing mechanisms to support entrepreneurship

159.499.999	4,37%	1	1a	3.1. Upgrade and / or development of research and innovation infrastructures to	Number of patents (pct patents): from 11 (2013) to 17 (2023) Average references per publication of Greek researchers: from 4,89 (2013) to 5,50 (2023)
360.491.942	9,89%	2	2a	3.2. Expanding broadband infrastructure and high-speed networks	% coverage of high speed broadband connections: From 27% (2013) to 50% (2023).

Specific Objective 1.1: Within this objective "All co-financed by the EU investment will be fully aligned with the RIS3, in order to create competitive advantage through the development and assignment of strengths in research and innovation with business needs, to exploit emerging opportunities and market developments".

Actions relating to the Investment Priority 1b will primarily focus to support the competitiveness of Greek enterprises through the mobilization of private sector investment in research, technological development, innovation and openness to international markets. Examples of areas where they can implement actions are: Materials and Construction; Cultural and Creative Industries; Food and agriculture / food industry; Environment; Health; Tourism; Supply Chain (Logistics); Energy; and ICT.

Quantitative targets include: improve the innovative capacity of the country to support entrepreneurship

Code	Indicator	Target
CO1	Number of enterprises supported	2000
T4202	Number of participations in companies assisted research and development innovation	2000
CO26	Number of companies that cooperate with research institutes	360
T4203	Number of new / supported knowledge-intensive businesses (spin-off and spin-out)	66
T4204	Number of joint projects with R & R agencies of other countries (with or without coordination with the EU)	70

Specific Objective 1.2: It is stated "The business innovation based on digital technologies is an important factor in increasing competitiveness and outward orientation of Greek ICT sector through the development of ICT products and services, as well as e-commerce. Moreover, the ICT industry is a key piece in the production chain of all strategic sectors, as it functions in order to serve the increasing needs, as reflected by global technological trends. In particular, the proposed intervention aims at the following results:

- Supporting the adoption of emerging technologies and networks in the digital economy
- Development of ICT products and services and enhance e-commerce and e-business
- Enhancing business innovation based on digital technologies"

Quantitative targets include:

Code	Indicator	Target
T4205	Number of ICT providers supported	200
CO 01	Number of enterprises supported (receiving digital services providers)	1000

Specific Objective 3.1: This objective "will strengthen existing or new research infrastructure of national importance, needed to support smart specialization strategy and the European Charter on Research Infrastructures (ESFRI), creating an attractive environment for research in Greece, the development and promotion of innovation. Specifically, the areas for improvement (without limitation) include: (1) Completion of high quality research infrastructure in key sectors for the country; (2) Establishing mechanisms for technology transfer from research institutions in business and public organizations; (3) Establishing a mechanism for monitoring and adaptation research on market needs; and (4) Strengthening participation of Greek researchers infrastructure intergovernmental organizations of Europe and national infrastructure of EU Member States through the European and transnational programs.

Quantitative targets include:

Code	Indicator	Target
T4225	Number infrastructures supported	25
CO 25	Number of researchers working to improved research infrastructure	1000

Specific Objective 3.2: This objective is "expected to achieve the following results:

- Strengthening of wired and wireless broadband penetration and broadband various speeds
- Increase the percentage of firms that have fixed broadband access
- Strengthening the Digital Economy (electronic communications and ICT) to contribute to national development, fostering innovation, openness of the domestic digital production."

The actions that relate to this Investment Priority will support broadband infrastructure and high speed networks. In particular, the actions will be focusing on bridging the digital divide between urban and Greek regions, the development of broadband infrastructure based on new generation networks, the Digital Agenda for Europe 2020, and the creation and development infrastructure for cloud services.

Quantitative targets include:

Code	Indicator	Target
CO 10	Additional coverage of households with broadband speed of 30 Mbps	3.500.000
T4 227	Additional businesses with broadband access at speeds greater than 30 Mbps	70.000

2. The National Strategic Framework for Research and Innovation 2014-2020 (ESPPEK 2014-2020)

ESPPEK 2014-2020 is the National RIS3 2014-2020[1] elaborated by GSRT in collaboration with social partners from the private and public sector, ministries and regions. It is structured along the following pillars:

Diagnosis
"The Greek System Research, Technological Development and Innovation has strengths related to good performance in co-financed by the EU Framework Programmes, strong Greek research community abroad, high quality workforce and islands of excellence in public research institutions and private sector, scientific publications above the EU average). These advantages, however, have not been exploited to such an extent, and this is mainly due:

- The research is oriented to fields associated largely with the interests of research groups and funding opportunities and less in areas related to the economy.
- The demand from businesses for new knowledge generated through research is limited.
- The structure of the productive fabric of the country, which largely consists of small firms with low knowledge-intensive activities, leads to sluggish demand for Research and Innovation, and low investment in research by firms.
- The lack of specialized investment funds and lack of technology transfer mechanisms are additional impediments to the innovativeness of firms and innovation altogether.

Moreover, till now, efforts to enhance research and innovation activity in enterprises were mainly horizontal and frittering financing to small interventions across the spectrum of the economy, ignoring the specific systemic failures of individual sectors and economic activities. Reversing the current policy model in the new programming period, the focus of support, both at national and regional level, will focus on the economic activities in which either have or can develop competitive advantages with significant multiplier effects on the economy, prosperity and employment."

Global vision:
"The restructuring and strengthening of research, technology and innovation to address the structural challenges of the Greek economy and become the key pillar to improve the competitiveness and productivity, reducing regional inequalities generated by the lack of access to new technology, and the creation of sustainable employment with respect to the environment and the cultural heritage of the country."

Including the overall target to increase R&D expenditure to GDP from 0,67% (2011) to 1,20% (2023) and Business R&D expenditure from 0,23% (2011) to 0,38% (2023).

Priority areas
The selection of 8 priority areas in agrofood, tourism, energy, health and pharma, ICT, transport and logistics, environment and sustainable development, materials and construction, and the creation of respective innovation platforms that are the core of national consultation, gathering representatives from the industry, research centers, universities, ministries and region with main objective to contribute to the ongoing process of identifying critical activities that should be the focus of research and technological efforts.

Actions and instruments are focusing on

[1] The description is based on the document of GSRT "Εθνικό Στρατηγικό Πλαίσιο για την Έρευνα και Καινοτομία 2014-2020 – Περιληπτικό Κείμενο Διαβούλευσης» (ESPPEK 2014-2020), Athens 2014.

- Increasing private investment in RTDI priority areas, which is the key strategic priority and marks the main shift to a new growth model which directs the operations to a few areas where the country has or can build competitive advantages arising from the smart specialization strategies
- Fostering entrepreneurial discovery and pilot emerging economic strengthening activities for enrichment or reorientation of smart specialization strategies
- Strengthening and establishing research infrastructure nationwide, serving strategic priorities of the country, in association with areas of Smart Specialisation and the European Roadmap for Research Infrastructures (ESFRI),

and main instruments related to support of innovation are:

- Key Enabling Technologies,
- Human capital,
- Research infrastructure, and
- International cooperation.

3. Consistency of EPANEK 2014-2020 and ESPPEK 2014-2020

3a. Consistency of EPANEK research, innovation, and digital growth result, output indicators and targets with the results of the RIS3 SWOT or other analysis

The research, innovation, and digital growth target, output, and result indicators[2] of EPANEK partially match to RIS3 SWOT and other analysis to be found in the National Strategic Framework for Research and Innovation 2014-2020 (NSFRI) of GSRT.

This is due both to different levels of elaboration – with EPANEK being more detailed than NSFRI – and different focus of attention – with EPANEK being more targeted the companies than NSFRI.

In particular,

a1. The overall targets regarding R&D expenditure and Business R&D expenditure coincide and an increase is foreseen both in EPANEK and NSFRI documents:

- R&D expenditure as % of GDP from 0,67% (2011) to 1,20% (2023), and
- Business R&D expenditure as % of GDP from 0,23% (2011) to 0,38% (2023).

However, these targets are set for 2020 in the NSFRI and for 2023 in EPANEK.

a2. The EPANEK defines a series of quantitative targets in the Specific Objective 1.1, concerning the support of about 4.500 companies, but such data are not given in the NSFRI.

a3. In the EPANEK Specific Objective 1.1, quantitative data and targets about the companies to be supported are allocated by type of regions (less developed, in transition, developed). However, such regionalisation is not given in the NSFRI, neither RIS3 strategies are elaborated at this level of regional aggregation.

[2] The terms targets, outputs, and result indicators are used as below:
- Targets are quantitative objectives of actions and interventions;
- Output indicators capture direct outcomes of actions and interventions;
- Result indicators reveal the real impact of actions and interventions

a.4 The EPANEK, in the Specific Objective 3.1 concerning research and innovation infrastructures to improve the innovative capacity of the country to support entrepreneurship, sets out as targets the increase of patents from 11 to 17 (per year) and the average number of references per publication of Greek researchers from 4,89 (2013) to 5,50 (2023). A number of 25 research infrastructures will be supported and 1000 researchers will be working to these infrastructures. Again such targets are not provided by the NSFRI.

a.5 The diagnosis of the research and innovation backwardness in Greece and the global R&I vision defined in the NSFRI, aim towards the restructuring of the entire productive tissue of the country, starting from the eight (8) sectors of priority selected. However, the overall number of companies to be supported by EPANEK and be involved in R&I actions (circa 4500 or 6% of companies) correspond to a small percentage of companies in Greece, and does not fulfil the NSFRI global objective "address the structural challenges of the Greek economy and become the key pillar to improve the competitiveness and productivity".

a.6 The EPANEK, in the Specific Objectives 1.2 concerning digital growth and business innovation based on digital growth, defines as targets to support 200 ICT providers and 1000 enterprises, but such data or targets are not provided in the perspective priority of NSFRI.

a.7 The specific objective 3.2 of EPANEK is about broadband networks and next generation networks. This chapter however and such data are totally absent in the NSFRI. Furthermore, the quantitative targets CO 10 and T4 227 of EPANEK are not sufficient to examine how this OP complies with the Digital Agenda Scoreboard targets (DAE 2013) that foresees:
By 2015

- 33% of SMEs selling online
- 20% of population buying online
- 60% of disadvantaged people using Internet regularly
- 75% of population using Internet regularly
- 15% of population having never used the Internet
- 50% of population using e-government
- 25% of population using e-government and returning forms

By 2020

- Fast broadband (>30Mbps) coverage for all
- 50% of households taking broadband subscriptions >100 Mbps
- 100% increase in ICT R&D public spending

3b. Research, innovation, and digital growth priority axis and description of the actions in EPANEK with respect to RIS3 specialisation fields and policy mix (including possible horizontal / generic support measures).

b.1 Priority fields in EPANEK and national RIS3 as presented in the NSRFI 2014-2020 coincide in eight cases: agrofood, tourism, energy, health and pharma, ICT, transport and logistics, environment and sustainable development, materials and construction.

The EPANEK introduces also a ninth "sector" of priority, under the name of creative and cultural industries, including miscellaneous producing and services activities such as:

- Creative industries: textiles and clothing, footwear, leather goods, fur, silversmith, apparel, toys, and crafts,
- Cultural industries: cinema, gaming, visual arts, performing arts, publishing books, producing and selling copies of monuments.

In the design of strategy in those sectors, EPANEK was based on Sectoral Planning Groups composed of various social partners and the elaboration of Sectoral Development Plans. In the case of the national RIS3, the General Secretariat for Research and Technology proceeded to refine the sectoral strategies through innovation platforms, which offered the core of national consultation bringing together representatives from business and industry sectors, research centers, universities, ministries and regions. However, the content of analysis and strategic perspective in the eight common sectors differs substantially, with the GSRT focusing on technologies mainly, while the EPANEK is closer to an analysis of value chains and supply - demand relationships.

b.2 Policy mix
Annexes A and B of EPANEK provide a description of the policy mix per priority sector, including specific objectives and categories of intervention per specific objective.

In the national RIS3, GSRT does not differentiate actions per priority sectors, but proposes a common to all sectors policy mix including:

- Support towards three groups of companies: those having developed research activities; those without research and innovation activities, in search of technological modernization through the purchase of equipment, and new knowledge-intensive businesses.
- A policy composed of tested instruments, such as innovative clusters; innovation through public procurement; spin-offs; innovation vouchers; Public Private Partnerships; support to research and experimental development; partnerships between public research laboratories to provide specialized R & D services.

3c. Innovation-related support actions in the OP EPANEK under investment priorities 1a, 1b, 2b or 2c NOT consistent with the RIS3

c.1 All actions under the investment priority 1a are consistent with the national RIS3.

c.2 Actions under the investment priority 1b that are not consistent with the RIS3 are those related to cultural industries and creative industries. This "sector" is additional to the eight priority sectors selected by the GSRT. Support is foreseen under the specific objective 1.1 (p. 49) and through the financial engineering tools (p. 54).

- "Cultural and Creative Industries: Support for research and development of domestic raw materials (e.g. appropriate and quality raw material for pottery, cotton and other domestic raw materials for the textile industry such as hemp, flax, periploca greca, Asclepiades, sparto, quality wood for furniture). Support for research, technological development and production of entertainment software tools and digital content. Development of commercial entertainment software for international markets, social networking technologies. Developing creative content such as artwork, 3D modelling, texturing, music and sound, video and animations, web production. Development and application of innovative techniques of gamification" (p. 49).
- "Financial instruments (IS) can be used in actions of this investment priority (1b), in combination with each other or in combination with grants. The recording below is indicative as the use and content has not been finalized at this stage. The aid will be granted to businesses in nine (9) priority areas either through grants or through financial tools eg venture capitals, business angels, investment funds, seed capital, early stage VC etc., or through other forms peculiar to the needs of specific categories of business." (p. 54)

c.3 Actions under the 2b investment priority are about expanding broadband infrastructure and high-speed networks. The NSRFI 2014-2020 (national RIS3) does not contain any chapter on digital growth or broadband infrastructure.

c.4 No actions are foreseen under the investment priority 2c.

3d. Percentage of the budget for the research / innovation / digital growth priority axis that goes into horizontal / generic support actions and which is targeted exclusively at the RIS3 specialisation fields?

d.1 The research, innovation and digital growth budget of EPANEK is composed by actions under the specific objectives 1.1, 1.2, 3.1, and 3.2. The overall budget for these objectives is 1,34 billion Euro and correspond to 36.78% of EPANEK budget.

EPANEK priority axis	Thematic Objective	Investment Priority	Specific Objective	EU support in Euro	% OP
1	1	1b	1.1. Increase of business initiatives and partnerships to develop innovative entrepreneurship in accordance with national RIS3	661.231.214	18,13%
1	2	2b	1.2. Increase the supply of digital services, applications and integrated ICT solutions for business	160.000.000	4,39%
Total budget targeted to RIS3 priorities				821.231.214	22,52%
3	1	1a	3.1. Upgrade and / or development of research and innovation infrastructures	159.499.999	4,37%
3	2	2a	3.2. Expanding broadband infrastructure and high-speed networks	360.491.942	9,89%
Total budget targeted to horizontal / generic priorities				519.991.941	14,26%
TOTAL				1.343.376	36.78 %

Horizontal actions are those of EPANEK priority axis 3 focusing on the upgrade and / or development of research and innovation infrastructures and broadband networks. To these actions is allocated a budget of 0,519 billion Euro of 14.26% of the EPANEK budget.

d.2 The RIS3 document at this stage does not provide information on budget allocation. Therefore, we cannot assess whether the EPANEK budget is consistent with the RIS3 indicative budget planning.

4. Recommendations

Based on the above described consistency analysis, we suggest the following recommendations:

Rec1: Important differences characterise the analysis of EPANEK and ESPPEK, especially in the field of the priority sectors selected, with EPANEK focusing more on entrepreneurial issues and ESPPEK on technological ones. A better coordination and compelentarity is feasible. However, in both cases further analysis would be needed to define activities and areas of intervention that are causes of low productivity and competitiveness or may lead to productivity improvement and value added increase.

A good example that shows the links between specialisation, productivity and added-value is to be found in the recent publication of the Bank of Greece "Four proposals for the greatest contribution to the development of Greek shipping" <http://goo.gl/dyQrQW>.

Using transport statistics and benchmarking methods, this study concludes: "The average income of Greek-owned fleet of marine transport (NACE 50.2 - Sea and coastal freight water transport) amounted to about 60 Euro per dwt (tons deadweight), while for Japan, with corresponding fleet size to 100 euro, for Germany at 178 euro, and the EU to 200 euros. This happens because the Greek-owned fleet specializes in transporting oil and bulk (dry) load and is normally employed with short-term charters. Contrast, under German control fleet has a high concentration in the sector of container ships, engaged in long-term charters and whose management is usually performed by shipping companies based in Germany. Corresponding results have also emerged from a recent study on the economic contribution of European shipping. Although the Greek-owned fleet represents 43% of the EU fleet, Greece contributes only to 13% of gross value added by the shipping industry in the European economy, while the German interest fleet, representing 19% of the fleet, contributes by 20%. In addition, under the Norwegian or British interests fleet, which specializes in high value added activities, such as offshore oil drilling and ancillary services thereto, have much higher contributing share of their fleet in European gross value added. A different specialization of the Greek-owned fleer within the same sector of maritime transport (NACE 50.2) could contribute to an increase in gross added value by 3 percentage points of GDP."

Rec2: Both EPANEK 2014-2020 and ESPPEK 2014-2020 share the grand vision and objective to improve the competitiveness and productivity of the Greek economy. In particular, "EPANEK marks the main shift in the new development model and highlights the central role of productive, competitive and extroverted economic sectors". However, only 5-6% of the total population of companies are expected to receive support from the EPANEK in the selected 8 priority sectors. This represent a small percentage of total companies, and it is questionable whether it may lead to a substantial change in the Greek economy; in particular to sustain the transition towards a knowledge and innovation led economy. Therefore, primary importance should be given (a) to the calculation of the lower threshold of companies necessary to drive the Greek economy towards a new development model, and (b) defining this threshold as the minimum number of companies to be included into innovation support actions. The EPANEK should integrate the vision of a more inclusive innovation policy open towards all companies.

Rec3: The EPANEK includes also a ninth "sector" of priority, related to cultural and creative industries. This includes miscellaneous activities from textiles and clothing to movies and games, which fall under many NACE codes. Actions towards this 9th "sector" should be excluded from support of Specific Objectives 1.1 and 1.2, since this sector is not a priority within the national RIS3.

Rec4: Some discrepancies are observed between the target and outcome indicators used in the EPANEK and ESPPEK. For instance, it is advised using the same time frame for all indicators, preferably 2020, to which all EU documents and target indicators are referred.

Also, The EPANEK uses some indicators for company support by aggregating regions by categories types such as less developed, transition, and developed regions. However, none RIS3 is elaborated at this level of regional aggregation, and therefore it is not feasible to assess the consistency of those targets between EPANEK and RIS3. It is advised breaking down companies or other final beneficiaries by the 13 Greek regions. This will allow a better coordination between sectoral and regional OPs also.

Rec5: Actions under the specific objective 3.1 and 3.2 of EPANEK dealing with ICT services and broadband networks should comply with the targets set by European Digital Agenda Scoreboard for 2015 and 2020.

The Digital Agenda for Europe foresees that (i) by the end of 2013, basic broadband should be available to all Europeans, (ii) by 2020, all Europeans should have access to much higher Internet speeds of above 30 Mbps, and (iii) by 2020, at least 50% of European households should subscribe to Internet connections above 100 Mbps. Also, strategic plan at national or regional level for the deployment of Next Generation Networks is a precondition in order to achieve the above objectives.

R6. The policy mix of EPANEK should be adapted to the policy mix of the national RIS3 (ESPEK). Instruments proposed in ESPEK, such as innovation platforms, support towards KETs, encouraging demand for innovative products and services through public procurement demand, innovation vouchers, and Public Private Partnerships, should also be part of EPANEK action plan. The "innovation platform" concept is very promising and it is advised to extend this concept from consultation to policy mix, identifying and offering by innovation platform instruments and tools for innovation intelligence, foresight, technology learning and training, innovation development, marketing and market access.

Also, some provision should be made concerning the allocation of funds per categories of beneficiaries, such as companies, research and university institutes, technology intermediary organisations, human capital support, etc.