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FORSEE
Regional ICT Foresight exercise for SEE countries

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# Green Paper on Regional SEE Foresight

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| *Output Title* | **Green Paper on Regional SEE Foresight** |
| *Work Package* | **WP3 – Context Analysis and Taskforce Formation** |
| *Activity* | **3.5 – Green Paper on Regional SEE Foresight** |
| *Short Description* | **The Green Paper constitutes the basis for the Consultation process at a national level. It aims at stimulating discussion and debate and providing a vision of the foresight exercise.** |
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# Executive Summary

In today's knowledge-based economies, decision making in RTDI takes place in high volatile and complex societal and technological conditions and thus requires input generated by future activities, so as to estimate the current potential, intelligence, the openness of possible futures and acquire better flexibility in policy implementation. Europe in general and South-East European countries in particular face unprecedented challenges that call for enabling factors to encourage smart growth coupled with employment and research intelligence. In this line a combination of coordinated action and intelligence-anticipatory activities are the kernel of strategies based on innovation paradigms that surpass long-standing structural problems and shape a basic framework for long-term growth.

Currently, most of the European strategies outline the need to move towards smart, sustainable and inclusive growth. R&D is one of the focus areas to ensure that the strategy delivers policy actions geared towards these goals. South-East European countries have embraced European strategies but coherence in the development of R&D and innovation policies as well as strengthened partnerships, coordination and institutionalised, dialogue-generating activities with stakeholders are still underdeveloped. In this framework, foresight provides strategically important information to feed in policy making and is an enabler for mobilising socio-economic actors towards consensus around the valorisation of opportunities in R&D. Foresight on a regional level can play a pivotal role in the formulation of requirements that contribute to innovation such as monitoring the performance and suggesting improvements in policy implementation and ultimately in marking of a region's transition path towards a paradigm conducive to innovation and growth. Foresight can also be used to address system failures in a NIS, improve knowledge flows, emphasise inclusiveness and contribute to a more distributed governance model for policy-making.

One of the challenges in innovation polity is anticipating current developments and establishing more collaboration between public and private players and a constant monitoring of societal needs. Innovation patterns are rapidly changing, evolving toward "open innovation" and more regular cooperation between enterprises and other research actors. RDI activities are becoming increasingly internationalised, while co-innovation and crowd sourcing initiatives begin to flourish. Therefore, new challenges are emerging on how to establish ongoing consultations through permanent platforms, exploit the wealth of networks and exploiting network externalities to facilitate co-innovation by extending the scale and scope of external partnerships to exploit new technologies, knowledge and markets. It is thus among the objectives of FORSEE to contribute to such a "problematique". The main objective of FORSEE is the development of a methodology that will be made available to allow SEE governments to perform national/regional foresight exercises with the contribution of all stakeholders. Foresight will be introduced through the project to the SEE participating regions as a systematic, participatory, future-intelligence-gathering and medium-to-long-term vision-building process aimed at present-day decisions and mobilising joint actions.

IntroductionThe 'FORSEE - Regional ICT Foresight exercise for Southeast European countries' project targets ICT Research, Development and Innovation (RDI) policy reform in the South-eastern Europe

region and aims to introduce a sustainable mechanism for ICT foresight in the region. It ultimately aims at making foresight a permanent, continuous and normal part of all planning at all levels.

The Green Paper on Regional SEE Foresight constitutes the basis for the Open Consultation process both at national and regional level. As part of the FORSEE methodology, the Open Consultation events take place in each participating country and serve at increasing awareness and dissemination, discussing theme-specific issues and future-oriented discussions. An *initial SWOT analysis* on selected ICT, R&D specific research areas and the Green Paper are the available tools for the stimulation and the assistance of the discussion.

In this line, the Green Paper formulates the grounds for concerted discussion by providing a vision for the FORSEE exercises, the "big picture" in terms of the used methodology as well as the FORSEE specific proposition. The report is structured as follows:

The second part outlines the vision and mission of foresight in general by reflecting on the link between foresight in theory and the FORSEE specific approach as well as by listing the objectives and the long terms of the project so as to provide a holistic view of foresight view and its mission in the regional context, as attempted by FORSEE.

The third part introduces the FORSEE proposal in terms of both the rationale and process of the ICT research areas selected for exercise implementation and in terms of summarising the main situation in the area. The ICT research areas are outlined in a schematic view for easy reference while the situation in the area is illustrated by extracting important conclusions of previous work in the context of WP3.

Finally, the fourth part provides specific information as regards the Open Consultation events, their aims, structure and the baseline questions that will add to the "future" dimension and common future vision for the region on the selected areas.

The document Annex extrapolates some empirical points, diagrams and tables that contribute to the understanding of the "Regional diagnostics" discussed in the fourth section. The full document can be accessed through the FORSEE website.

# 1 Vision and Mission

## 1.1 The FORSEE Approach

The 'FORSEE - Regional ICT Foresight exercise for Southeast European countries' project targets ICT Research, Development and Innovation (RDI) policy reform in the South-eastern Europe (SEE) region and aims to introduce a sustainable mechanism for ICT foresight in the region. It ultimately aims at making foresight a permanent, continuous and normal part of all planning at all levels.

The project proposes a focused effort on introducing a foresight culture in the region, which is necessary in order to accelerate socioeconomic growth in participating countries', striving to meet the challenges of the global networked economy and to participate on equal footing in the European Research Area. FORSEE's main objective is to identify the shortcomings of the ICT RDI sector in the region and orchestrate the establishment of a regional collaboration network, working on ICT foresight and exploring synergies and complementarities between research resources in the target countries. The project channels its efforts to addressing both national and regional stakeholders in the sector and will provide a participatory platform for collaboration in order to ensure that the outputs will receive wide acceptance and will inspire the necessary sense of regional ownership. One of the most important elements of the project is the implementation of pilot ICT foresight exercises in all participating countries based on a regional methodology adapted to the region's capacities and resources.

FORSEE will implement an approach for implementing policy review in ICT Research and Innovation introducing transnational cooperation underpinned by its regional partnership. The regional benefits will result from implementing the foreseen foresight activity through the synergies of its regional partners, in comparison to the outcomes produced through isolated national exercises. The benefit for the region stems from increasing the efficiency through regional cooperation and avoiding duplication of efforts and waste of valuable resources for activities that address common needs and problems in South East Europe. However, benefits will also be drawn from the recognition of cross-border complementarities that will rise from the identification of national competences and advantages in each participating country.

The central objective of FORSEE is the development of a methodology that will be used regularly beyond the span of the project to allow SEE governments to perform Regional Foresight exercises with the contribution of all stakeholders in an organised and effective manner, and to use the output as a tool for Policy Review in the field of ICT RDI. FORSEE will begin with a process of designing the Foresight exercise, the context analysis per country and the staffing of the taskforce by representatives of project partners and external Foresight experts (including regional stakeholders).

The project will place particular focus in establishing the basis for an open collaboration process between governmental institutions, scientific communities, enterprises and civil society, by opening an inclusive dialogue, synthesising views and creating a sense of regional ownership. It will also target bridging transnational collaboration opportunities and identifying complementarities that the SEE countries could exploit in order to make better use of their limited resources in funds and expertise under a regional planning process that would give access to the accumulated innovation products of all participating regions. The participation of all stakeholders in each participating country will be ensured

in open dialogue events and the input provided will be used to form the final output. FORSEE also comprises the assessment and evaluation of the Foresight process in the end, as well as the extraction of relevant policy recommendations that target regional policy-makers in the region. It will also focus in providing a concrete regional plan for investment in the field, integrating the outputs of the exercise to provide a tangible sustainability plan for the future.

The project partnership is comprised by a variety of organisations ensuring the institutional capacity, the political commitment and the orientation towards policy making throughout the exercise. The Lead Partner is the University of Patras (Greece) while the rest of the partnership consists of:

1. the National Institute for Research and Development in Informatics (Romania)
2. the Ministry of Education, Youth and Science (Bulgaria),
3. the University of Macedonia (Greece),
4. the Centre for Social Innovation (Austria),
5. the Ministry of Education, Science, Culture and Sports (Slovenia),
6. the University of Ljubljana (Slovenia),
7. the Bulgarian Association of Software Companies (Bulgaria),
8. the Institute for Sociology, Centre for Social Sciences, Hungarian Academy of Sciences (Hungary),
9. the Industrial Systems Institute/ RC Athena (Greece).
10. the Mihajlo Pupin Institute (Serbia),
11. the Ministry of Science and Technological Development (Serbia),
12. the University of Montenegro (Montenegro).

The project rationale is portrayed in figure 1 below. The figure illustrates three main phases, as derived from the project's objectives and activities. The first phase focuses on the inputs of the foresight exercise (background analysis), the second on the process of the proposed foresight exercise methodology so as to achieve regional consensus while phase 3 marks the project's outputs, which are generally perceived as capacity building in the region. The FORSEE process is horizontally supported by the national and regional Taskforce to ensure a framework for cooperation.

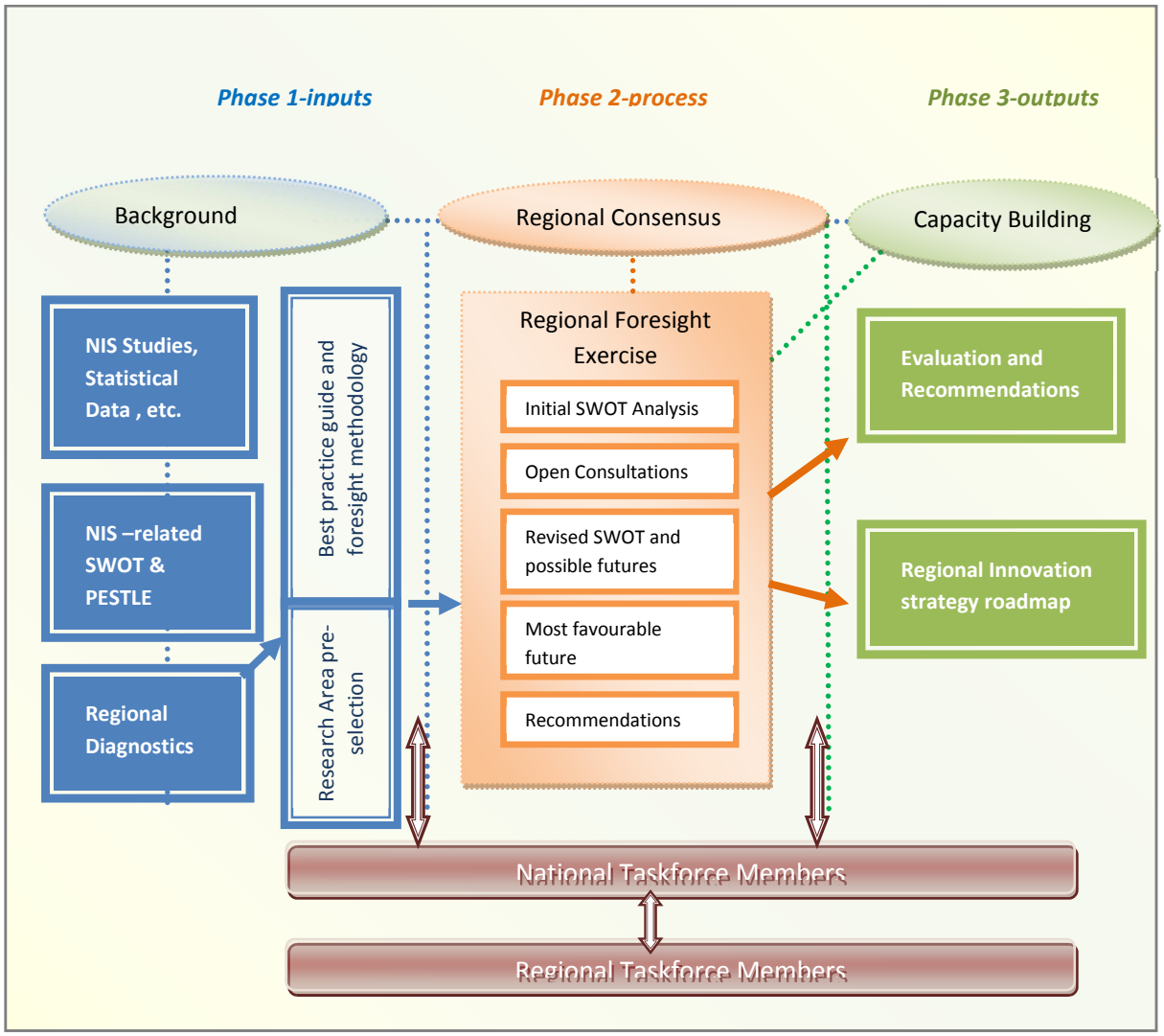


**Figure 1. FORSEE Project Rationale**

## 1.2 Objectives & Long term goals

FORSEE orients itself around the notion of regional foresight and creates a framework for embedding foresight on a regional level through multiple synergies. The underlying logic is that foresight supports interactions between actors in order to develop futures and share common visions. Regional actors are confronted with many challenges, especially in the SEE region, where a participatory approach to decision making and forward-looking policy institutions are vital to reinforcing cooperation in the region and enable them to cope with new challenges. In an integrated Europe, local and global competition further increases the motivation to engage in regional foresight, create networks or regional stakeholders and provide a platform for mutual learning and capacity building (1). Despite the growing regional disparities in countries, regional processes for informing decisions and embedding policy processes remain crucial.

The main objective of FORSEE is the development of a methodology that will be made available to allow SEE governments to perform national/regional foresight exercises with the contribution of all stakeholders. FORSEE will thus endow the SEE region with the foresight methodology, a concrete framework for co-operation among stakeholders and governments at national and transnational level, policy and capacity building recommendations and a regional innovation and entrepreneurship enhancement strategy roadmap.

Ultimately, FORSEE aspires to embed a foresight culture in the SEE region. The implementation of a regional foresight exercise will provide regional stakeholders with adequate tools, resources and a process that will be applicable regularly in the future to enable them to anticipate trends and developments, to join forces with their neighbours to compete in the global environment, to bridge the local industry and academia and to make better use of scientific resources creating business opportunities while responding to strategic national/regional needs. It is, therefore, envisaged that foresight exercises will become an integral part of the policy making process in the region. Other "spill-over" effects regard the direction-setting and vision-building of foresight, anticipatory intelligence through background intelligence for government entities as well as private actors to formulate longer-term R&D plans and consensus generation through communication networks between the "knowledge triangle" and the engagement of different groups of actors. Finally, awareness raising and communication mechanisms stemming from foresight indirectly contribute to the objectives of FORSEE (2) (3) (4) (5) (6) (7) (8).

FORSEE will conclude with the development of feasibility analysis and a plan for the establishment of a Regional Foresight Centre. In this way, long term success and continuation of relevant activities will be ensured, laying the foundations for participating regions to reap associated benefits over the short-term future.

# 2 Baseline Process and methodology

FORSEE aspires to approach and involve a wide range of stakeholders in the area and in specific:

- Individuals , such as independent experts and persons actively involved in the ICT research policy-making but also in the other social spheres/industries
- Administrative actors , such as governmental institutions (e.g. ministries, agencies etc.), related to the ICT Research, Development and Innovation (RDI) activities
- Private sector actors, such as Chambers of Commerce and Industry, Industrial Associations, Branch Associations, Foundations, enterprises involved in the field of ICT Research, Development and Innovation (RDI)
- SMEs , i.e. representatives of micro, small and medium-sized enterprises, operating in the field of ICT RDI, and
- Academia members, including educational institutions and research organisation with a focus on RDI.

The added value for stakeholders involved in FORSEE will be an enhanced tool for policy review in the field of ICT RTDI, a robust methodology developed in an open, participatory manner, used beyond the scope of the project to allow governments perform exercises in an organised, effective manner and on a more generic level the creation of a foresight culture for specific ICT fields that will potentially enhance innovation and improve policy at the regional level. FORSEE will also produce an equalising effect among stakeholder's aspiration in terms of RDI agendas and its future orientation thereof.

## 2.1 FORSEE methodology

The FORSEE methodology has been elaborated by a methodology team, comprising of a small group of experts. The methodology considers issues of regional relevance and sets the key scoping elements of the exercise and related processes. It also maintains a modular character in that some tasks are identical for all project partners, namely analyses of the regional themes, while other tasks are to be performed by a group of country teams and a generic character to allow for local customisations based on the specificities in each country's policy-making modus operandi and availability of resources. The following flowchart illustrates the FORSEE methodology on a generic level[1]:

[1] The highlighted step denotes the specific stage that the project currently goes.

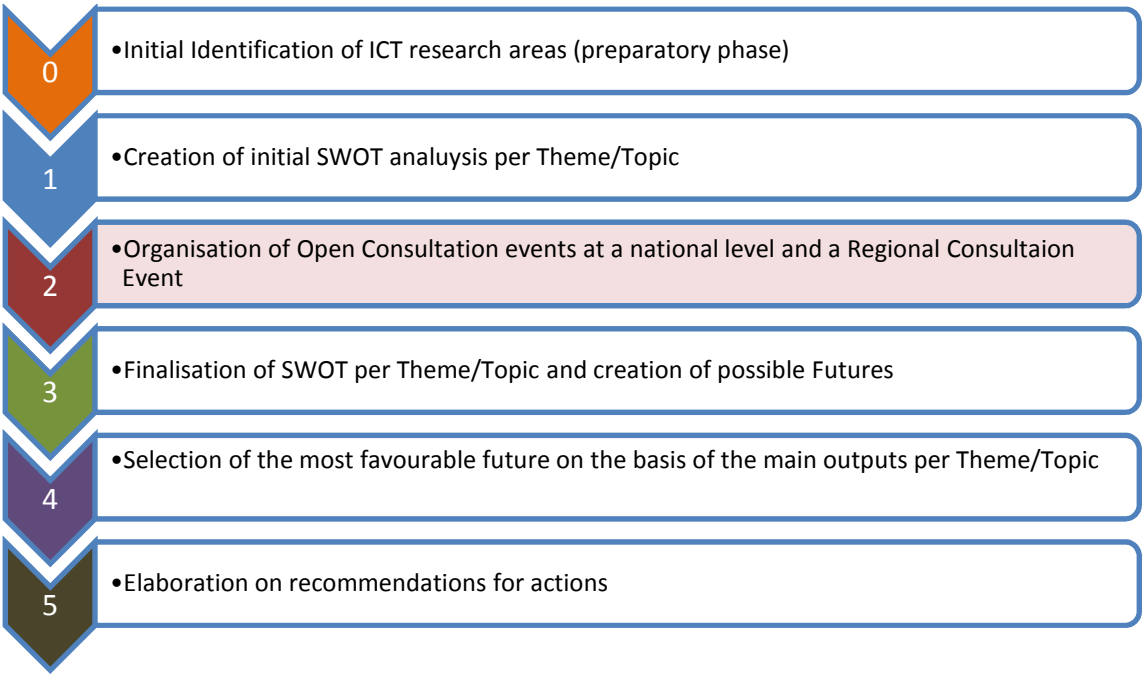


**Figure 2. Overview of FORSEE Methodology**

A short discussion of the main building blocks of the foresight process follows.

**1. Creation of *initial SWOT analyses* per theme/topic:** After the selection of the specific research areas[2], the first major analytical effort calls for a conducting of *initial SWOT analyses* so as to identify – for each selected ICT themes – the strengths and weaknesses as well the opportunities and threats. These initial thematic SWOT analyses will be used in the Open Consultation events as a main building block of the discussion to be initiated.

2. **Organisation of Open Consultation events:** A National Open Consultation event will take place in each country participating in the project. The results of these events are to be used in the Regional Open Consultation event. The consultations will serve at increasing awareness and dissemination, discussing theme-specific issues and future-oriented discussions. The aim of the National OCs is to revise the initial SWOT analyses so as to reach inputs to be used in the next steps of the Foresight process and address future-oriented paths.

3. **Organisation of a Regional Consultation Event:** A Regional Open Consultation event will take place in Slovenia and the participants will be stakeholders representing the participant countries in the FORSEE project. The regional event will summarise and process the results and widen the consultation process. A validated list of themes, summary SWOT per theme and short images of the future will emerge as a result of this step.

4. **Creation of the *Final SWOT* and design of possible futures**: The results of the National and Regional Consultation events will be used for the finalisation of the SWOT per theme and for the design of 2-4 possible futures per theme through the work of partners and experts.

[2] The selection of the ICT themes/topics is analysed in the next chapter of the Green Paper

5. **Selection of the most favourable future:** The aim of this activity is to reach a conclusion on the most favourable future per theme/topic. A short questionnaire will be developed for the web-based assessment of futures by the stakeholders, the stakeholders will assess through this tool the futures and then answers will be collected and evaluated by the partners.

6. **Drawing of recommendations:** The objective of the final phase is the generation of recommendations for actions to be taken involving key matters such as the "who", "when" and "what" to do and focusing on recommendations tailored to stakeholders and actors. During the recommendations phase, the collaboration among partners and experts will be facilitated by the organisation of targeted workshops.

## 2.2 National and Regional Taskforce

To achieve its objectives, FORSEE will establish a Regional Taskforce, as the main operational body, responsible for coordinated the development and running of the exercises as well as national Taskforce teams in each country, to encompass both the participatory and the regional character of the exercise. The Regional Taskforce (RTF) will be a transnational structure constructed as an assembly of representatives of National Taskforce teams, as a maximum of 2-3 representatives of national teams. It will have a central role in the core implementation of the Foresight process, guiding national procedures and ensuring cohesiveness in the implementation of key tasks of FORSEE project. The Regional Taskforce will have an overall supervision of the foresight exercise implementation in all participating countries.

The Taskforce team in each country include about of 2-3 external members, preferably representing the "knowledge triangle", including expert representatives of the policy makers, of the academia for ICT Research agenda setting and of the ICT market/ industry for RTDI stimulation. Experts experienced in foresight and individuals involved in interdisciplinary policy/strategy formulation in each country will be selected to take part in the Taskforce. The National Taskforce will calibre to guide and support the implementation of foreseen activities related to the exercise. It is also noted that the members of the National Taskforce are selected against specific guidelines and criteria set to ensure a basic level of homogeneity.

# 3 The FORSEE proposal

## 3.1 FORSEE ICT Research Areas

The underlying rationale behind selected research areas was the "problematique" that research areas will be relevant in a given timeframe and actions can be taken on a regional level, i.e. lead to joint/coordinated/orchestrated actions, exchanging ideas, sharing experience on the implementation and impacts of country-level actions. In addition, major actors of the sub-region (e.g. policy-makers, businesses, academia, NGOs) should be willing to act together in a coordinated/orchestrated way or exchange ideas and share experience.

The focus on the FORSEE Regional ICT Foresight Exercise is techno-economic (competitiveness) and societal, that is, a combined approach that accommodates both the economic dynamics and the grand societal challenges that lie in the heart of the European Innovation approach and related policies.

A sufficient number of research areas at the regional level was initially proposed and the Partnership has engaged in a multi-stage deliberation and discussion process that consisted of mixed bottom-up/top down approach:

1. Extracting/Extrapolating common challenges, opportunities and capacities from the synthesis report
2. Examining ICT taxonomy in European Framework Programmes to ensure that the language/taxonomy used will be familiar to stakeholders. To this end, the ICT Programme of the 7$^{th}$ Framework Programme and Horizon 2020 (8$^{th}$ Framework Programme) as well as the CIP ICT PSP programme (The ICT Policy Support Programme ), as well as supporting documents/policies such as the Key Emerging Technologies etc.
3. Identifying the most relevant themes and elaborating on each one against a set of parameters
    a. EU relevance, i.e. degree of congruence with taxonomies previously discussed
    b. Focus areas, i.e. main topics in the theme general domain, issues on the agenda
    c. Key trends and forces that shape the nature and future of each theme
    d. Specific topics under each theme, comprising of their definition , top challenges, sample EU-funded projects, regional benefits, level of existing competences in the region, ICT sectoral impact, economic value and social impact as well as alignment of stakeholders to the each theme
4. Running an online survey of each research area, accessible internally to partner organisation so as to "equalise" gravity with the previous step
5. Running an online survey of each research area accessible to external national experts per theme
6. Evaluating the results and selecting the research areas.

This multi-stage process was not *ex-ante* designed, but was based upon gradual concerns of the partnership that evolved throughout the progress of work, the elaboration of the methodology and the regional aspects that needed to be taken into consideration. The process also ensures adequate

involvement of both the partnership and external stakeholders to avoid prejudice and subjectivity in the selection of appropriate research areas.

The initial list of proposed research areas included 9 research areas with several topics included in each. This list was minimised through the process described above and yielded the final selection, as illustrated in the figure below: The vertical axis illustrates the basis of selection in terms of EU relevance, i.e. European Framework Programmes, current trends, focus areas and survey results (internal and external).

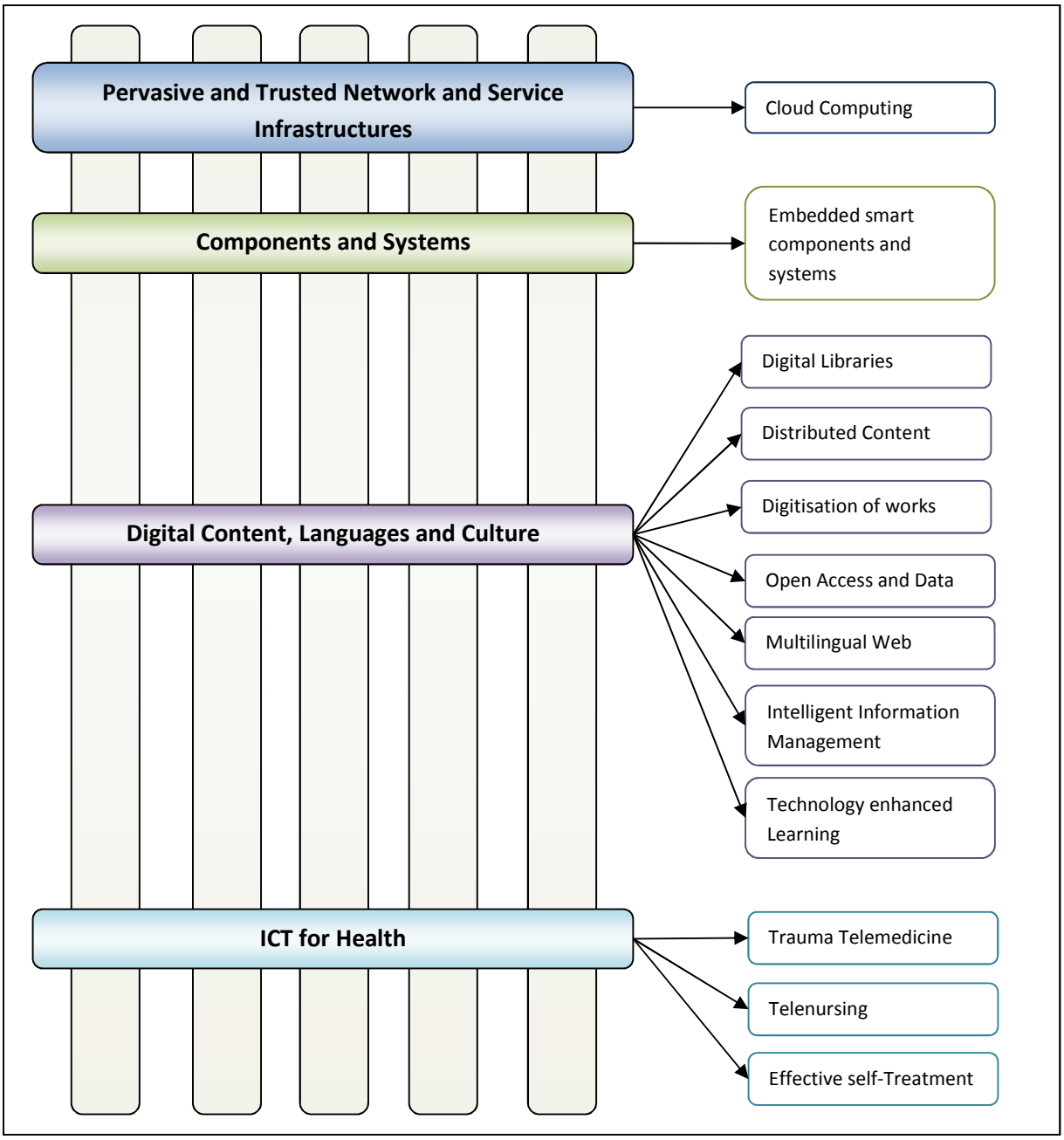


**Figure 3. FORSEE ICT Research Areas (1)**

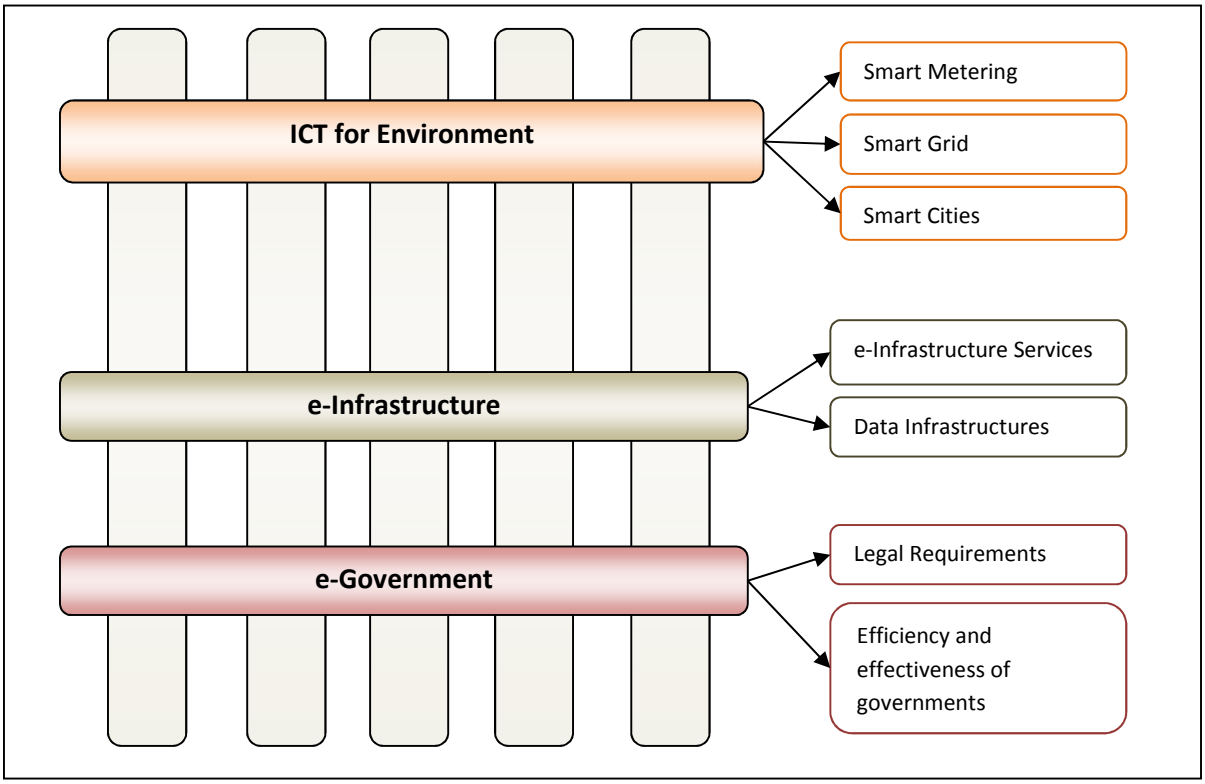


**Figure 4. FORSEE ICT Research Areas (2)**

Stage I of the foresight process (SWOT analysis) was performed for all the above themes. The partnership decided for efficiency to reduce the number of themes that will participate in the exercise.

Thus, the research areas were reduced to 3 based on the concept of selecting those Themes that have an immediate impact on Societal Challenges and presenting a major application. The themes selected are the following:

- **ICT for Health**
- **e-Government**
- **Digital Content (narrowed down to focus on aspects that have immediate impact on societal challenges**

Due to the interdisciplinarity of the research areas identifies, cloud computing, e-infrastructures and embedded systems remain on the agenda as enabling factors to grand applications.

## 3.2 Results of Regional "Diagnosis"

The stage of regional "diagnosis" bases itself on the results of WP3 and in specific the regional synthesis report which aggregated the results of eight National Innovation reports as well as an initial PESTLE&

SWOT analysis. The framework of analysis involved a literature survey of EC-generated performance documents, the national reports as well a wide range of statistical indicators[3].

SEE countries consist of diverse and complex area in Europe, characterised by highly disparate economic, social, infrastructural, technological and institutional diversities. Different institutional and legal frameworks and structures, GDP disparities, growth performance and factors of competitiveness are severely misaligned, rendering comparisons in innovation capacities complex. SEE countries have evolved in particular historic and political contexts that have endowed the countries with different perspectives on research and innovation policies and practices. Under the innovation spectrum, the countries under review are classified differently in terms of performance. Austria and Slovenia are considered as innovation followers, Greece and Hungary as moderate innovators while the rest of the countries as catching-up. The main discrepancies lay upon GDP, government debt and employment growth. In general, the countries face social and economic challenges such as an ageing population, negative external balances and in general a lack of a competitive advantage.

In innovation performance, each country capitalises on specific "pillars" and faces deficiencies related to structural disadvantages. Some common competitiveness aspects can be indicated in higher education and training, quality of education, ICT usage rates, internet usage rates, broadband and R&D infrastructure and quality of scientific institutions. Most of the countries though face severe deficits in terms of university-industry collaboration, partnerships, technology absorption, technology transfer and quality of public and private institutions. In terms of Europe 2020 indicator SEE countries have inherent differences against criteria for inclusive growth.

In more specific terms the results were assessed against specific parameters or "pillars" and in specific:

1. **Human resources pillar.** The educational systems and the profiles mirror inherent differences in educational traditions and the prioritisation of human resources as an enabler for innovation. Secondary and tertiary education attainment seems to be high in the region, but there a clear shortage in lifelong learning in most of the countries scoring low and very low, but with sufficient structures in Slovenia and Austria. Notwithstanding the quality of educational institutions, most countries suffer from high levels of unemployment in RTD personnel. In most of the countries the innovation RTDI systems are not yet well-structured and mature to enable absorption of researchers and highly skilled personnel to stimulate research careers. Deficiencies can intuitively be identified on the job training in most half of the countries. Therefore, the links between education and RTDI as reflected in the percentages of employment in Knowledge-Intensive high technology services and R&D personnel are quite weak. In addition, 1/10$^{th}$ of the personnel employed in knowledge/intensive activities is employed in high-technology knowledge intensive activities.
2. **Knowledge flows consisting of science-industry collaboration, partnerships and key actors.** Knowledge flows enable either strong performance or creating fragmentation of actors and weaknesses in commercialisation routes. This parameter consists of one of the major "weaknesses" of the countries, as there are rather low levels of collaboration between science

[3] Interested parties can further consult the synthesis report and/or the specific National Innovation System report of individual countries, available on the website dedicated space.

and industry. Most of the countries report a rather weak collaboration of the research triangle; the only metric available refers to the GCR rank and in particular the "University-industry collaboration in R&D". The results classify Austria and Slovenia in considerable global rankings (18th and 37th respectively), Hungary and Montenegro score in medium terms, however Greece, Bulgaria and Romania are classified among the last ranks globally (112th, 110th and 102nd) indicating severe structural inefficiencies within their systems. The issue of these links is a long-lasting challenge and needs concentrated action. In countries such as Austria, Slovenia and Hungary, historically there are long-established partnerships between businesses and higher education institutions and intermediary organisations have been "bridging" mechanisms deeply embedded in the innovation culture, characteristics that are almost non-existent in the rest of the countries, in which the research systems corresponds to an orientation in a more traditional productive sector.

3. **Level of Internationalisation of knowledge** reflecting patents, publications, participation in European research and trade specialisation. South-East European countries are among those having limited cross-border activities, and quite differenced trade patterns. The external balance in ICT trade is negative in most of the countries with the notable exception of Hungary, while Greece and Austria also perform well in high-tech exports. In addition, ICT patents in the region fluctuate around 7-8 % with the exception of Greece (25 %). The region is also characterised by average flows of FDI inflows and outflows, relative to GDP. In a more "narrow" sense, Multinational Enterprises play a crucial role in trade but not as important actors in the innovation landscape. Finally, the performance of Greece and Austria is admirable in participation in EC-funded research framework programmes (8th and 9th place on a pan-European scale) while the rest of the countries' participation is rather weak.

4. **Infrastructure and Funding.** The specificities on funding models of RTDI policies might affect regional foresight since policy-making needs to orient itself according to the modes and differences in each country. Regarding the contribution of the private sector in RTDI funding there seems to be a big gap with countries in which its contribution is insignificant (such as Bulgaria and Greece) on the one hand and countries in which its contribution is increasing (such as Romania, Austria, Hungary and Slovenia). Public funding appears to be of high significance for Greece, Bulgaria, Romania, Serbia and Montenegro. In addition, in most of these countries, about one third goes to university funding. Austria and Slovenia are the only countries with increased BERD levels with an aim to eliminate the percentage of public funding (nearing 2 %). The volume of venture capital in GDP is rather small and the "Death Valley" is an eminent risk in the case of SEE countries.

5. **Innovation and the Business Environment,** capturing firm-specific trends. On average, enterprises in the region spend about 0.83 % of their turnover in non-R&D expenditure. The prevailing type of innovation is both technological and non-technological innovation. Specific indicators demonstrate a general failure of innovation to reach the market. Regarding the type of innovation in SEE countries, product and service innovation is the dominant type, in compliance with the EU average. Enterprises in the region interpret innovation opportunities mainly as increased demand for sustainable or energy-efficient products and services as well as new export markets in emerging countries outside Europe (10). Notwithstanding national

differences some notable trends are on the one hand increased opportunities in sustainable (energy-efficient products) export markets in emerging countries and more limited opportunities in terms of innovative products and services to meet ageing population and new demands for social, education and health services. There seems to be a lack of coherence regarding RTDI performances inside the private enterprises of the participant countries. Strategic partnerships with research institutes and educational institutes remain limited in preference, verifying the narrow links of the countries in the knowledge triangle. A notable exception is Slovenian (and partly Austrian) enterprises which remain more focused in the links with educational institutes. In addition, the open innovation paradigm started to gain in importance in the region, as open innovation practices reinforces the importance of innovation, improve its effectiveness and diversify networks. Still, there is a large number of external factors to the firm affecting is ability to adopt open innovation practices, such as the supply of outside knowledge, highly-educated personnel, effective legal systems and IP protection. Collaboration with foreign countries seems to be a quite unexploited issue of innovation-spurring activities in enterprises, not only in the region but in the EU as well.

Furthermore, the general policy orientation and the priorities set in the countries under review have been strongly marked by their accession paths to the EU which has exerted influence on the development milieu and innovation policies. Countries appear to focus on supply-side measures in their innovation policy mix (subsidies, loans, venture capital, etc.) whereas demand-side policies (importance of public sector, lead markets, pre-commercial procurement) are not pronounced, gaining in gradual but little importance, despite their role in spurring modernisation of the economy and accelerate catching-up of countries and regions. The common denominator of policies is sustainable development and economic growth, and a strong degree of congruence with European policies (e.g. Europe 2020 strategy etc.). The main common policies consist of supply of human resources for RTDI; support to SMEs/Entrepreneurship; development of Innovative infrastructure and Centres of Excellence; the general increase of competitiveness and the exploitation of key national strengths. Reinforcement of the participation of the private sector in R&D activities and funding- Innovativeness of companies and cooperation is of pronounced importance while less common patterns in policies regard the improvement of quality of life and services through the use of ICT and restructuring the RDI system.

The common priority axis concern education and training and the transition towards a knowledge-based society, research infrastructures, addressing societal challenges, forging partnerships (among research actors), improvement of the institutional framework, promotion of innovation activities in the private sector as well as support of innovative entrepreneurship and competitiveness. It is noted nevertheless that there is a lack of a central coordinating mechanism that can coordinate the activities of the ministries, of other RTDI related actors or even the policies themselves due to the fragmentation of their governance.

### 3.2.1 PESTLE Analysis

PESTLE analysis helps formulate an initial understanding of the environment of the region, so as to be strategically aligned for success. The factors under examination (political factors, economic factors, social factors, technological factors, legal factors and environmental factors) characterise the environment of each country and assesses the key trends that may affect the innovation landscape. The following figure presents the results of the PESTLE analysis.

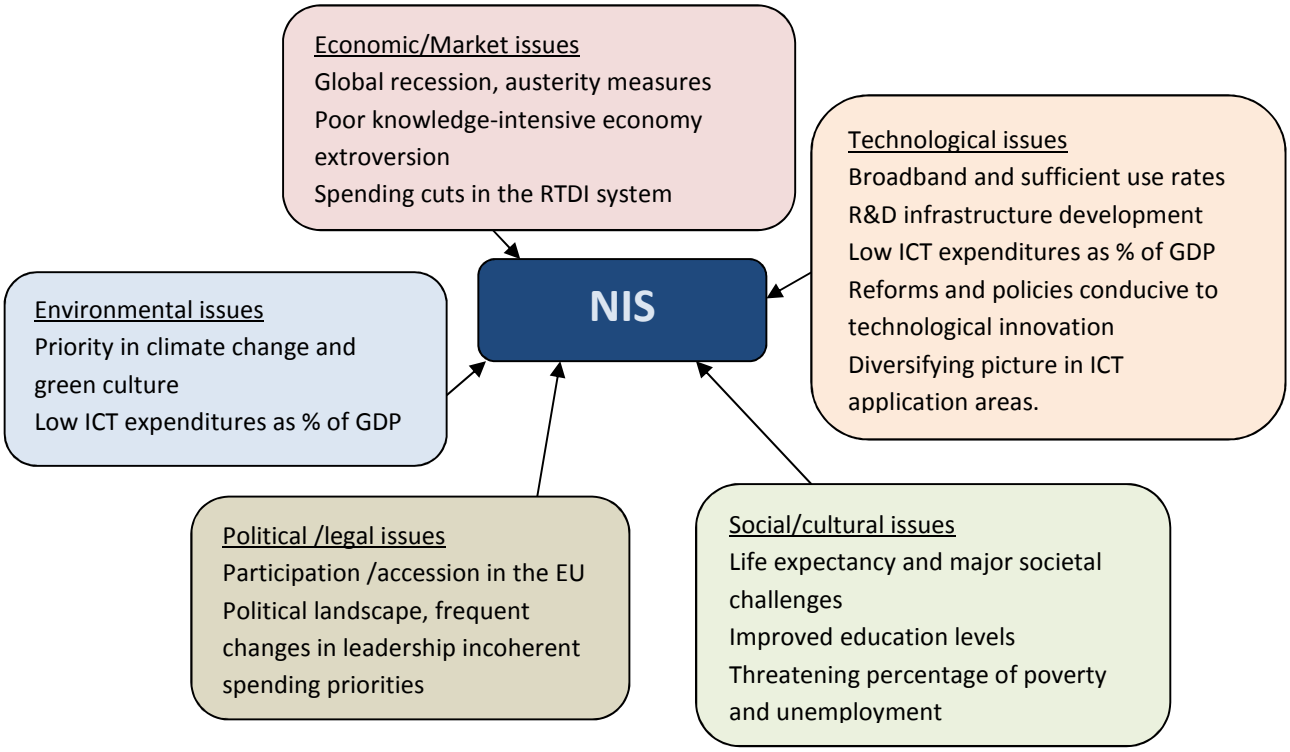


**Figure 5. Major PESTLE forces with a potential impact in the region**

From the PESTLE and SWOT analysis, it was obvious that the countries have highly distinct economic, social, infrastructural, technological and administrative and institutional disparities and diversities, due to specific historic circumstances.

The SWOT analysis brings forward the strengths, weaknesses, opportunities and threats so as to synthesise the overall assets and barriers conducive to the purposes of foresight. The country analysis is performed by the partnership as a preliminary screening of the general environment; therefore the results are not expert-validated. The extrapolation of key strengths is denoted by the frequency of the statements present in national reports. Only the most common items are enlisted in the table.

**Table 3.1. Synthesised regional SWOT**

| **Strengths:** | **Weaknesses:** |
|---|---|
| • Investments (and plans) in hard R&D infrastructures and broadband<br>• High levels of ICT penetration/growth<br>• Improved educational structures<br>• Adequate policy mix to support RTDI<br>• Priority of ICT in national strategies | • Low BERD percentages /weak contribution of the business sector<br>• Low investments in information technology<br>• Low level of lifelong learning<br>• Low usage of ICT in the learning process and in eBusiness<br>• Few innovative enterprises<br>• Lack of Venture Capital/Risk Capital Fund for innovative SMEs and start-ups |
| **Opportunities:** | **Threats:** |
| • Exploitation of niches/ new domains, based on regional knowledge<br>• Support for increasing science-industry collaboration<br>• Focus on innovative clusters in strategic industries<br>• More strategic implementation of EU policies and programmes<br>• Educational system can be geared towards strategic advantages | • Cuts in expenses for RTDI in light of economic downturn<br>• Responsiveness and adaptation of the education system to market demand<br>• Rigid, complex insufficient system for market efficiencies<br>• Regional disparities regarding distribution of innovation<br>• Lack of vision for an innovation-led culture<br>• Brain drain to other countries, insufficient HSRT in national employment due to conditions |

It is noted that the SWOT/PESTLE analysis for Serbia and Montenegro are quite diversifying, as they mainly draw on reforms and newly born priorities in RTDI. The synthesised SWOT takes into consideration their statements however some issues pertaining their specific NIS should be taken into heed such as their recent orientation to an open economy paradigm, pertaining ICT barriers such as lack of ICT skills, emerging role of the knowledge based economy and ICT focus in national strategies, low investments into ICT RTD but emerging spending in infrastructures, high dependence of RTD on government funding and weak transfer of research to the market, weak partnerships and fragmented public policies. These two countries manifest recent institutional changes in order to promote research and innovation and strong transition attempts to a knowledge-oriented economy however they are faced with policy challenges that most of the countries have surpassed to some extent.

The background work performed so far signalled towards a number of factors that mark the unlocked potential of the region to formulate innovation prerequisites:

- High level of education & solid academic base
- Transition away from the traditional NIS approach to more citizen-centric forms of innovation, indicative of a quadruple helix.
- Increasing number of centres and excellence
- Well-designed , cross-implemented innovation policies at the highest political level
- Streamlined instruments on supply and demand-side and smart specialisation strategies
- Institutionalised partnerships among research actors and the public sector
- Concerted R&D efforts by corporations and SMEs in the innovation arena
- Growing European interactions between national R&D players
- A well-functioning system of venture capital and micro-financing

# 4 Open Consultation Events Related Aspects

### 4.1.1 Open Consultation Events Goals and Preliminary Structure

According to the methodology plan the Open Consultation process is organised to achieve three major aims:

- *validate the research areas ( themes) for the foresight process*
- *discuss the initial SWOT analyses*
- *discuss future-oriented questions to collect stakeholders' aspirations*

Except from these explicit roles of the OC's as an integral part of the FORSEE methodology, there are more implicit aims of the process, as the partnership is also to gain:

- *incubator of new ideas/forward-looking visions*
- *starting point for mobilising social actors and stakeholders, creating networks between institutions and the "knowledge triangle"*
- *testing ground for new concepts, methods and techniques*
- *discussion forum for the robustness of the FORSEE methodology*
- *mechanism for social control of science and technology*
- *social process of institutional/scientific adaptation*

The suggested structure of the events revolves around 3 main parts:

1. Plenary Session (all participants). A presentation will be given by the hosts so as to "set the scene" of the process, state the objectives and the process of methodology as well as the expected outputs of the events. Optionally this session can present key outcomes of the synthesis report (diagnostics).
2. Parallel Sessions (break-out panels limited to the experts involved in each research area) on the research areas identified. In the sessions, relative stakeholders and experts will be engaged to discuss the *initial SWOT analysis* results, allow a discussion of future-oriented questions and paths on the research areas and allow brainstorming on future paths.
3. Wrap-up –Debriefing closing session (all participants). This section will sum up future-oriented questions of all research areas discussed in the parallel sessions, present an overview of parallel discussions and obtain feedback by participants. The discussion can be extended to embrace some general issues regarding innovation and entrepreneurship enhancement strategy, general policy issues, etc.

# 5 Abbreviations, Glossary, References

## 5.1 Abbreviations

| Abbreviation | Full name |
|---|---|
| SEE | South East Europe |
| JTS | Joint technical Secretariat |
| EU | European Union |
| EC | European Commission |
| NIS | National Innovation System |
| OC's | Open Consultation Events |
| PESTLE | Political, Environmental, Social, Technological and Legal analysis |
| SWOT | Strengths, Weaknesses, Opportunities and Threats |
| R&D | Research and Development |
| RTI | Research, Technology and Innovation |
| WP | Work Package |

## 5.2 References

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