

Erasmus + **KA2: Cooperation for innovation and the exchange of
good practices**

Knowledge Alliances



SME/HPC

**Enabling SMEs to gain competitive advantage from the use
of HPC**

Generic HPC Benchmark Audit Instrument

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Introduction

SME/HPC is a tailor-made high-performance computing (HPC) education programme for SMEs. HPC allows for big data to be processed with unprecedented efficiency. This emerging technology is a game-changer for both academia and businesses. While most advanced HPC infrastructures and knowledge are located at HEIs and research institutions, enterprises, especially SMEs, have little or no access or competences to use it, in spite of remote access. In fact, few SMEs are aware of the potential of how HPC can drive enterprises' competitive advantage and enhance the levels of innovation capacities, capabilities and practices of SMEs. This leads to both the under-utilisation of existing expensive infrastructure and the less-than-optimal solving of real-life socio-economic issues. Furthermore, in less developed regions the lack of competences to embrace new technologies, like HPC, leads to a range of adverse conditions such as lower levels of innovation, few patents, low value-add and major brain-drain, which further increases the economic gap and digital divide between European regions.

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SME/HPC takes a pioneering step towards improving the awareness about the innovative potential of HPC by SMEs by co-designing tailor-made courses delivering a coherent set of competences required for the application of HPC in SME and micro-enterprise contexts. *SME/HPC* begins with a strategic dialogue yielding an assessment of the required HPC competences, continues with the development of innovative strategies for raising HPC awareness and building HPC skills, and finishes with testing the new educational material with HEIs and enterprises. Three semi-peripheral regions will pilot the *SME/HPC* methodologies of HEI-Business engagement and the HPC education material.

The key beneficiaries of *SME/HPC* are enterprises, with a particular focus on SMEs, acquiring both HPC competences and access to hard infrastructure. Furthermore, the positive experience and increased collaborative and cooperative engagement between HEIs and businesses will inspire future co-designing and co-implementation of innovative socio-economic solutions.

Regional HPC Benchmark Audit Instrument

The purpose of the **Regional HPC Benchmark Audit Instrument** is to systematically assess the levels of **awareness and usage of HPC in the business sector** in the pilot regions of Ireland, Romania and Slovenia. Therefore, data will be collected from a representative number of enterprises (small, medium, large, indigenous, and foreign owned) about the knowledge, understanding and use of HPC skills and processes in their respective organisations, as well as the data about the availability and access to HPC infrastructure. This data will provide the consortium partners with a comprehensive in-depth knowledge about all relevant aspects of the HPC landscape in each of the three pilot regions.

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The work will have several phases. First, the consortium will generate a benchmark audit instrument. Secondly, it will, if necessary, adjust this instrument to take regional nuances into account. Thirdly, the consortium will conduct the regional HPC benchmark audits, in which data will be collected for secondary analysis (mostly, but not exclusively, documentary and report analysis) and primary analysis (e.g. surveys, semi-structured interviews, focus groups etc.). These findings will be presented to relevant regional stakeholders.

In order to provide the necessary information, we developed two tools: **Regional HPC Benchmark Audit Instrument - Desktop Research** and **Regional HPC Benchmark Audit Instrument - Interview Guidelines**. These documents outline the necessary steps, techniques, responsibilities and the required draft documents for data collection under *WP3*. This first part of data collection protocol provides overview of the entire process and details desktop research and qualitative data collection (semi-structured interviews).

Desktop Research

The **Desktop Research** (see Appendix I) has the aim to extract data from publicly available sources, primarily through online search. Desktop research work will focus on two topics:

- first, to identify the current state of implementation of digital technology in general and HPC in particular, as well as the possibility of HPC applications in pilot regions with the particular focus on the business environment.
- second, to develop an overview of HPC providers and competence centres, i.e. their infrastructure, thematic orientation, competencies, linkages with the business environment

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The engaged project partner responsible for data collection on specific region must fill the document Desktop research report (Appendix I) following the below outlined requests:

- General appraisal of the level of awareness and usage of HPC in the business sector (summary is expected to be in total of 200 words of length)
- Assessment of the Business sector in the region, including market orientation and needs, thematic focus, available IT infrastructure. Identify the relevant business sectors for using HPC) (approximately 1000 words)
- Availability of HPC hard infrastructure and soft competencies (communication, teamwork, problem solving, etc.) in the region, including experience, thematic focus, available infrastructure etc. Identify the relevant institutions (approximately 1000 words)
- Applications of HPC in the business sector (approximately 1000 words)
 - good practices
 - level of technological development
 - other relevant aspects
- Applications of HPC in the industry for R&D (approximately 1000 words)
 - good practices
 - level of technological development
 - other relevant aspects
- Cooperation between academia and the business sector (approximately 1000 words)
 - appraisal of situation
 - good practices
 - applications of HPC
 - other relevant aspects
- Other region-specific relevant aspects (approximately 500 words)
- References & data sources

Qualitative Data Collection

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The **Interview Guidelines** (see Appendix II) has the aim to conduct semi-structured interviews with the members of the business community, business consultants, etc. This will allow us to get insight to innovation processes and to understand the obstacles and opportunities of HPC applications in innovative processes.

Semi-structured interviewing involves asking questions and getting answers from participants. Semi-structured interviewing is different from survey; it allows more freedom to interviewers and interviewees to formulate question and replies to adjust to specific situation, allowing us to explore unexpected relevant subtopics.

We have to do at least one interview in each pilot region. In order to get the best possible information, we will conduct group interview which will include at least following participants:

1. Representative from SMEs
2. Representative from HPC provider or competence centre. (Please note that in case you interview person from your institution, it must be a person who is not participating in SME/HPC)
3. Expert or consultant familiar with the topic of innovation and digitalization of industry.
4. Representative from the public sector (regional or national level) dealing with innovation policy, relevant from the perspective of this proposal.

It is possible to include other relevant participants but note that is very difficult to conduct interview with more than 7 or 8 interviewees. After you have identified relevant interviewees, you contact them. One possible approach is email with a contact letter.

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IMPORTANT (!!!) Experience shows that it is very important to identify and contact relevant respondents as soon as possible. Relevant interviewees are often very busy, reluctant to talk, and it is generally not so easy to coordinate the timing, so it is very important to start with the organization well in advance.

Interviewing procedure

1. The group interview will be conducted in a setting where interviewees will feel comfortable and relaxed. This is usually neutral terrain (e.g. university building), in a room with round table and chairs. You may offer them drinks and snacks to relax.
2. The interview is conducted in English (preferable) or in national language, if participants cannot or refuse to be interviewed in English.
3. The interview is recorded. You should get their consent in advance, to avoid any issues before the interview is conducted. If necessary, you may again provide assurance of complete anonymity. To avoid technical issues, use two recording devices simultaneously. After the interview transcribe the entire interview.
4. We will use the interview guide (Appendix II) for our group interview. Interview guide is a set of questions through which we must go during the group interview. This will ensure comparison of information in different countries. If possible, try to encourage and moderate meaningful discussion between interview participants. This can help us get additional information about situation in specific countries.
5. The interview guide also includes score for each of the main questions, between 1 and 4. The participants have to reach a consensus on a specific score. Please note that this score is not the main goal of these questions, so we

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ask the participants to decide on a score only after we have discussed each question in detail.

6. The results of group interviews which will be emailed to WP3 leader FIS will be:
 - Recording and complete transcript of the interview.
 - Filled in interview guide (Appendix II) in English. This includes - for each main question - sections on strengths, weaknesses, additional comments and scoring.

Annex

Generic HPC Benchmark Audit Instrument - Desktop research report

REGION:

COMPLETION DATE:

General appraisal of situation (summary is expected to be in total of 300 words of length)

Assessment of the Business sector in the pilot region, including market orientation and needs, thematic focus, available infrastructure. Identify the relevant business sectors for HPC development (approximately 1000 words)

Availability of HPC hard infrastructure and soft competencies in the pilot region, including experience, thematic focus, available infrastructure etc. Identify the relevant institutions (approximately 1000 words)

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Applications of HPC in the business sector (approximately 1000 words)

- good practices
- level of technological development
- other relevant aspects

Applications of HPC in the industry for R&D (approximately 1000 words)

- good practices
- level of technological development
- other relevant aspects

Cooperation between academia and industry (approximately 1000 words)

- appraisal of situation
- good practices
- applications of HPC
- other relevant aspect

Other pilot region-specific relevant aspects of the HPC development (approximately 500 words)

References & data sources

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Generic HPC Benchmark Audit Instrument - Interview guidelines

Introductory questions

1. Which are the institutions/organizations responsible for high performance computing (HPC) in the pilot region?
2. What is the general situation regarding presence and use of HPC in academia and in the business environment in the pilot region?
3. How developed is the application of HPC in different spheres?
4. Are there many people / organizations / sectors using the HPC?
5. What are the main areas where do you see the possibility of application of HPC?



Questions on High Performance Computing and Innovation Profile

Question 1

*Please assess the level of application of HPC in the business sector in your region?
What are the strengths and the weaknesses related to the level of application of HPC
in the business sector in your region?*

Examples of important aspects concerning regional profile:

Capacity to innovate by application of HPC

General comments:

Strengths:

Weaknesses:

On a scale from 1 to 4 what is the maturity level related to the level of application of HPC in the business sector?

Score:

1	2	3	4

Any additional comments concerning the motivation of the score?



Question 2

What are the strengths and weaknesses concerning collecting, processing and disseminating High Performance Computing information (such as applicability, funding opportunities, potential partners, available know-how, technologies, etc.) in the region?

Examples of important aspects concerning collection, processing and dissemination of information characteristics:

Access to information, Relevant stakeholders involved in the process

General comments:
Strengths:
Weaknesses:

If you should translate all these strengths and weaknesses into ONE score on a range of 1-4 (four being maximum / most desirable), what would your score be for the process concerning collecting, processing and disseminating High Performance Computing information in the region?

Score:

1	2	3	4

Any additional comments concerning the motivation of the score?
--



Question 3

What are the strengths and weaknesses concerning applications of HPC in various enterprises?

Examples of important aspects concerning RTD characteristics of firms situated in the region:

Employment in different industries, R&D, R&D-characteristics (dependence on and performance in R&D, innovation and entrepreneurship, access to funding and cooperation, pro-active market approach) of individual enterprises, sectors and clusters, etc.

General comments:
Strengths:
Weaknesses:

If you should translate all these strengths and weaknesses into ONE score on a range of 1-4 (four being maximum / most desirable), what would your score be for the strengths and weaknesses concerning enterprises and R&D in the region?

Score:

1	2	3	4

Any additional comments concerning the motivation of the score?



Question 4

Is the existing HPC application oriented towards business R&D?

Examples of important aspects concerning orientation:

Orientation towards science, orientation towards non-applied research

General comments:
Strengths:
Weaknesses:

If you should translate all these strengths and weaknesses into ONE score on a range of 1-4 (four being maximum / most desirable), what would your score be for the orientation of existing HPC research towards business R&D?

Score:

1	2	3	4

Any additional comments concerning the motivation of the score?



Questions on Institutions

Question 5

What are the strengths and weaknesses concerning the role of the public authorities and/or intermediary organizations (e.g. technology transfer offices) for HPC?

Examples of important aspects concerning strengths and weaknesses concerning the role of the public authorities and/or intermediary organizations representing these authorities:

Presence of strong sectors, Support of R&D opportunities, Formal and informal trainings, funding

General comments:

Strengths:

Weaknesses:

If you should translate all these strengths and weaknesses into ONE score on a range of 1-4 (four being maximum / most desirable), what would your score public authorities and/or intermediary organizations representing these authorities?

Score:

1	2	3	4

Any additional comments concerning the motivation of the score?



Question 6

Does your region have the capacity to attract talented people [from other regions/countries], including – but not exclusively - those with HPC competencies?

Examples of important aspects concerning capacity to attract talented people within the region:

Professional Development, Rewards and Recognition, Migration Policy, Housing, Integration, Quality of Life, etc.

General comments:
Strengths:
Weaknesses:

If you should translate all these strengths and weaknesses into ONE score on a range of 1-4 (four being maximum / most desirable), what would your score be for the capacity to attract talented people within the region?

Score:

1	2	3	4

Any additional comments concerning the motivation of the score?



Question 7

Does your region have the capacity to retain talented people, including those - but not exclusively - with HPC competencies?

Examples of important aspects concerning capacity to retain talented people within the region:

Professional Development, Rewards and Recognition, Migration Policy, Housing, Integration, etc.

General comments:
Strengths:
Weaknesses:

If you should translate all these strengths and weaknesses into ONE score on a range of 1-4 (four being maximum / most desirable), what would your score be for the capacity to retain talented people within the region?

Score:

1	2	3	4

Any additional comments concerning the motivation of the score?



Question 8

What are the strengths and weaknesses of the regional/national business environment? (Also take into account conduciveness for HPC applications.)

Examples of important aspects concerning business environment within the region:

Long-term objectives, Innovation vision, Technology transfer measures

General comments:
Strengths:
Weaknesses:

If you should translate all these strengths and weaknesses into ONE score on a range of 1-4 (four being maximum / most desirable), what would your score be for the business environment within the region?

Score:

1	2	3	4

Any additional comments concerning the motivation of the score?



Questions on Networks

Question 9

How are networks organized (e.g. multi-sectoral, enterprises only or sector only, regional, cross-border etc.) and to which extent could these networks contribute effectively to the implementation of HPC in business R&D?

Examples of important aspects concerning network organization in the region:

Power symmetry, Openness to new actors, Differences in clusters, sectors or individuals

General comments:
Strengths:
Weaknesses:

If you should translate all these strengths and weaknesses into ONE score on a range of 1-5 (four being maximum / most desirable), what would your score be for the region?

Score:

1	2	3	4

Any additional comments concerning the motivation of the score?
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Question 10

What are the strengths and weaknesses concerning cooperation between stakeholders active in the business environment?

Examples of important aspects concerning cooperation between stakeholders within the region:

Key actors, Cooperation, Representation, Operation Contexts

General comments:
Strengths:
Weaknesses:

If you should translate all these strengths and weaknesses into ONE score on a range of 1-4 (five being maximum / most desirable), what would your score be for the strengths and weaknesses concerning cooperation between stakeholders within the region?

Score:

1	2	3	4

Any additional comments concerning the motivation of the score?
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Question 11

What are the strengths and weaknesses concerning cooperation between regional stakeholders active in the regional business environment and actors outside the region?

Examples of important aspects concerning cooperation between stakeholders and parties outside the region:

Added value, Differences in National and International Cooperation, Intermediaries

General comments:
Strengths:
Weaknesses:

If you should translate all these strengths and weaknesses into ONE score on a range of 1-4 (four being maximum / most desirable), what would your score be for the strengths and weaknesses concerning cooperation between stakeholders and parties outside the region?

Score:

1	2	3	4

Any additional comments concerning the motivation of the score?



Question 12

Do stakeholders/ entrepreneurs active in innovation and technological policy trust each other?

Examples of important aspects concerning trust for the interaction for innovation processes within the region:

Trust or lack thereof within and outside the region

General comments:
Strengths:
Weaknesses:

If you should translate all these strengths and weaknesses into ONE score on a range of 1-4 (four being maximum / most desirable), what would your score be for the role of trust for innovation process within the region?

Score:

1	2	3	4

Any additional comments concerning the motivation of the score?
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Questions on Cognitive Frames

Question 13

What are the strengths and weaknesses of the culture and attitude of the population concerning creativity, entrepreneurship and new technologies? (Take into account its conduciveness for implementation of HPC in business R&D.)

Examples of important aspects concerning strengths and weaknesses of the culture and attitude of the population’s creativity and entrepreneurship within the region:

Examples of creativity, propensity for new technologies etc.

General comments:
Strengths:
Weaknesses:

If you should translate all these strengths and weaknesses into ONE score on a range of 1-4 (four being maximum / most desirable), what would your score be for the culture and attitude of the population’s concerning creativity and entrepreneurship?

Score:

1	2	3	4

Any additional comments concerning the motivation of the score?
--



Question 14

To what extent do the attitudes and culture enable the learning processes in the region?

Examples of important aspects concerning attitudes / culture the learning processes:

Willingness to adopt new approaches, e.g. application of HPC in innovation processes and business R&D

General comments:
Strengths:
Weaknesses:

If you should translate all these strengths and weaknesses into ONE score on a range of 1-4 (four being maximum / most desirable), what would your score be for role of attitudes / culture for the learning processes?

Score:

1	2	3	4

Any additional comments concerning the motivation of the score?
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Question 15

Is competition seen as a positive value in your region?

Examples of important aspects concerning competition as a value for high performance computing within the region:

Importance of solidarity

General comments:

Strengths:

Weaknesses:

If you should translate all these strengths and weaknesses into ONE score on a range of 1-4 (four being maximum / most desirable), what would your score be for competition as a positive value within the region?

Score:

1	2	3	4

Any additional comments concerning the motivation of the score?



Question 16

What is the role of globalization with respect to adoption of new technologies in your region?

Examples of important aspects concerning globalization for innovation processes within the region:

Access to knowledge, Competition with foreign companies, Access to new markets, Accessibility of information, etc.

General comments:
Strengths:
Weaknesses:

If you should translate all these strengths and weaknesses into ONE score on a range of 1-4 (four being maximum / most desirable), what would your score be for the role of globalization for HPC development/ access?

Score:

1	2	3	4

Any additional comments concerning the motivation of the score?

Additional information on questions

This appendix provides detailed information on each important aspect. The information can be used as support for identifying strengths and weaknesses as well as for the scoring process.

Question 1

Please assess the level of application of HPC in the business sector in your region?

Additional questions

- 1.1. Are HPC processes part of the business R&D?
- 1.2. In your region, to what extent do companies have the capacity to access HPC?
- 1.3. Are the stakeholders able to identify needs and opportunities for innovation and entrepreneurship?
- 1.4. Is there a coherent, structured information management system/process that covers collecting, processing, disseminating and monitoring needs concerning HPC relevant information such as funding opportunities, potential partners, available know-how, technologies, etc.?
- 1.5. What is the situation concerning planning for development of new areas: ‘soft’ plans (procedures have to be started yet or are on-going) as well as ‘hard’ plans (procedures that are successfully finished)?

Question 2

What are the strengths and weaknesses concerning collecting, processing and disseminating High Performance Computing information (such as applicability, funding opportunities, potential partners, available know-how, technologies, etc.) in the region?

Additional questions

- 2.1. What information is available on know-how, national/ EU subsidies, technology, market information, etc.?
- 2.2. Do the relevant persons, groups, organizations and networks have access to the right information?
- 2.3. Is this access part of a structured (organized) approach?
- 2.4. Are the right stakeholders involved in processing information (based on need: representatives of authorities, enterprises, universities, education, etc.)?
- 2.5. How this process can be improved?

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Question 3

What are the strengths and weaknesses concerning applications of HPC in different enterprises?

Additional questions

- 3.1. Are there individual enterprises with a high dependency on Research Technology Development (RTD)?
- 3.2. Are there specific (potential) RTD high-performers of sectors or clusters?
- 3.3. Are there any specific / dominant types of innovation?
- 3.4. What are the innovation trends over the last decade?

Question 4

Is the existing HPC application oriented towards business R&D?

Additional questions

- 4.1. Is the usage of HPC oriented toward national level?
- 4.2. Is it in accordance to the main objectives of the development strategies and plans?

Question 5

What are the strengths and weaknesses concerning the role of the public authorities and/or intermediary organizations (e.g. technology transfer offices) for HPC?

Additional questions

- 5.1. Have the authorities identified (potential) strong sectors, clusters and enterprises?
- 5.2. Is the offered support coherent, complete and consistent?
- 5.3. Does the support effectively address the specific needs of new entrepreneurs?
- 5.4. Which stakeholders (e.g. universities, intermediary organizations) have the authorities actively involved in these support-processes and what are their roles?
- 5.5. Do institutions actively facilitate and stimulate the search and development of R&D opportunities based on synergy: win-win situations?
- 5.6. Do they effectively support identifying and addressing opportunities?
- 5.7. Do they provide formal/informal trainings?

Question 6

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Does your region have the capacity to attract talented people, including – but not exclusively - those with HPC competencies?

Additional questions

- 6.1. Are facilities such as providing human capacity for process management or specialised expertise delivered?
- 6.2. Which are the mechanisms through which the region attracts talented people?
- 6.3. How can these mechanisms be improved?
- 6.4. Who are the actors that contribute to attracting talented people in the region?

Question 7

Does your region have the capacity to retain talented people, including those - but not exclusively - with HPC competencies?

Additional questions

- 7.1. Which are the mechanisms through which the region retains talented people?
- 7.2. How can these mechanisms be improved?
- 7.3. Who are the actors that contribute to retaining talented people in the region?
- 7.4. How effective is the support for finding spaces / locations for expansion of companies or new enterprises?
- 7.5. Does the region have a good housing policy?

Question 8

What are the strengths and weaknesses regional/national of the business environment? (Also take into account conduciveness for HPC applications.)

Additional questions

- 8.1. Is there an explicit business vision or is such a vision part of other documents?
- 8.2. Which business objectives are formulated?
- 8.3. If long-term objectives are formulated: are short and medium-term objectives formulated for project phases as well?
- 8.4. To what extent are the SMART (Specific, Measurable, Acceptable, and Realistic) objectives specified in time?
- 8.5. Are plans covering all relevant innovation issues?
- 8.6. Which (other) plans (technological, industrial, science, spatial) are relevant to RTD issues and RTD performance?
- 8.7. Are all regional, national and international weaknesses/bottlenecks, strengths and/or opportunities addressed?

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- 8.8. Which organizations are involved (national, regional, municipal authorities, clusters/sectors of industry, individual companies, other stakeholders) in the planning and or the decision-making process and how?
- 8.9. How strong is the protection intellectual property?
- 8.10. How would you assess the quality of research institutions?

Question 9

How are networks organized (e.g. multi-sectoral, enterprises only or sector only, regional, cross-border etc.) and to which extent could these networks contribute effectively to the implementation of HPC in business R&D?

Additional questions

- 9.1. Are the networks considered effective concerning power symmetry, openness to new actors and ideas, creation of knowledge spill over and transfer to allow informal learning processes?
- 9.2. Are there present large differences between different clusters, sectors or individual enterprises concerning how linked / bonded they are to the region, why, and what are the consequences for the development of HPC?
- 9.3. Who has the leading role in organizing various network alliances?

Question 10

What are the strengths and weaknesses concerning cooperation between stakeholders active in the business environment?

Additional questions

- 10.1. Are PPP (Public Private Partnership) arrangements facilitated and/or used?
- 10.2. How well (based on satisfaction and output) do enterprises cooperate with knowledge institutions, authorities, higher education and, intermediary organizations?
- 10.3. Which stakeholders are leading specific modes of cooperation (science led, policy led, industry led) and how effective are these designs for innovation performance?
- 10.4. Is new cooperation developed based on the principle of added value and best solution, i.e. are partners chosen / involved because they have a clear added value for innovation development and actually represent the best option for cooperation?
- 10.5. Have key actors (individuals and organizations) been identified?
- 10.6. Are key actors representing all main innovation relevant stakeholders such as universities, authorities, enterprises or civil participants?
- 10.7. Do key actors operate within different contexts (mix of informal contacts and strong attachment, different networks) to allow quick identification of HPC needs and market opportunities?

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Question 11

What are the strengths and weaknesses concerning cooperation between stakeholders active in the business environment and actors outside your region?

Additional questions

- 11.1. Is new cooperation developed based on the principle of added value and best solution, i.e. foreign partners chosen / involved because they have a clear added value for an innovation development and actually represent the best option for cooperation?
- 11.2. What significant differences are there between different clusters, sectors or individual enterprises concerning national and international cooperation and what are the consequences for innovation performance?
- 11.3. How does cooperation with others e.g. universities and intermediary organizations stimulate and facilitate access of enterprises, clusters and sectors to international collaboration?

Question 12

Do stakeholders/ entrepreneurs active in innovation and technological policy trust each other?

Additional questions

- 12.1. What is the role of trust for the interaction between the stakeholders? Does it encourage or hinder cooperation?
- 12.2. Can trust between relevant stakeholders/ entrepreneurs be perceived as an important or not so important component for the HPC?
- 12.3. How trust between relevant stakeholders/ entrepreneurs can be improved?

Question 13

What are the strengths and weaknesses of the culture and attitude of the population concerning creativity, entrepreneurship and new technologies? (Take into account its conduciveness for implementation of HPC in business R&D.)

Additional questions

- 13.1. What are the national characteristics of the population?
- 13.2. Are they e.g. trend-setting, early adopters or do they have a rather conservative attitude?
- 13.3. Does the mentality of the population deviate from competitive environments?

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Question 14

To what extent do the attitudes and culture enable the learning processes in the region?

Additional questions

- 14.1 Are organizations, clusters, networks, groups and individuals willing to develop, try and adopt new approaches (technology and routines) even if current results are satisfactory (e.g. always aiming at continuous improvement)?
- 14.2. What are the main characteristics of attitudes and culture?

Question 15

Is competition seen as a positive value in your region?

Additional questions

- 15.1. Is competition necessary for HPC?
- 15.2. Do you consider that reward is necessary for HPC?
- 15.3. What is the role of solidarity for the development?

Question 16

What is the role of globalization with respect to adoption of new technologies in your region?

Additional questions

- 16.1. How globalization affects the HPC development/ access?
- 16.2. Can you name the positive effects that it has on HPC in the national context?
- 16.3. Can you name the negative effects that it has on HPC in the national context?