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| Rada pro výzkum, vývoj a inovace |

# ISAB recommendation on the National Priorities of Oriented Research (NPOV)

adopted at ISAB meeting on 15 October 2025

The ISAB points out, the NPOV document provides an extended list of scientific fields and disciplines, but often concrete information about solutions, materials, protocols and goals are not listed, therefore this aspect could not be evaluated, ISAB could provide only general comments.

E.g. the effects that the decarbonisation will have on the economy in general, on the population and on workers of certain sectors, who will need re-training and formation to new professions, adaptation to new labour conditions, is not discussed. Decarbonisation will affect workers of all ages, but different age-classes may have different skills or education, and their re-integration in the new working conditions will require multiple efforts.

In cutting-edge research, one always has to be surfing ahead on the next wave of innovation.  Or ideally to be and remain a trendsetter by setting off new waves of innovation**.**    The Czech Republic has the chance to become a trendsetter in some of the key technologies mentioned in this report.

One such new innovation wave could be Agent-based industrial AI for the long-term autonomous execution of tasks using many smaller models (SxMs) not only for language but also for actions (LAMs or SAMs) and processes (LPMs or SPMs) for specific domains, that use much less resources than the LLMs. Generative AI is not enough; we need new technologies which can act on behalf of the human operator/user/owner.

The area of Industry 4.0 has clearly documented the Czech capabilities to play leading, "ahead-of-the-pack" role in a specific research area. This is something what we do need in more areas these days.

The AI researchers are ready to play an important role and leverage their expertise in supporting other disciplines to reach the European leading edge. Vast deployment of Agentic AI, of LLMs and SLMs etc. etc. should strongly push research in such fields like energy distribution, smart cities, medical care etc. Especially, the areas of energy and AI are tightly linked together.

General comments:

Collaborations in International Research Programs and Organisations can increase the knowledge and expertise of Czech scientists in the field of the collaboration project, expecting that the knowledge, expertise and benefits gained are in balance with the costs.

Besides the International Cooperative Actions and the collaborative Programmes which imply organizations (States, Regions, Academia, Industries, SMEs, Research Organizations, etc),

significant advantages to the Czech Science resulted from the fellowships granted to talented scientists, to enable them to work in the worlds laboratories of excellence. There they learned, from the scientific leaders in the fields, the best working methods, strategies and habits. Most of them excelled upon their returning to the Czech Republic, founding productive groups with impressive publications, obtaining grants and becoming field leaders in CR.

The Czech Republic could consider a concerted program to repatriate the good scientists who have been trained in US and other states, to take advantage of the unique opportunity presented by the current political situation and improving conditions in Czech Republic.

To the expected NPOV impact

Science and Technology NPOV plan in Czech Republic bases the potential for future upon its already existing strong technology achievements in some areas, generated in the Institutes of Academy of Science, Institutes in Universities and Private Laboratories. In general, there is a large overlap of the key NPOV points with the EU Strategic Plan. Next to the ongoing support for the basic research, this document, focusing on oriented research, aims also to apply results of the research efforts for the benefit of the industry and society. Its separate funding as well as future-oriented formulation could follow e.g. the example of Germany ‘s High-tech Agenda.

Formulation of Czech Research priorities on the national and international level (whenever needed in consultation with industry), is one of the key conditions for spending the disponible research budget efficiently.

The energy Production and Storage are obviously the key of the NPOV document. The Czech Republic has large experience with nuclear energy power plant construction, energy production, maintenance and security of operation aspects. And it strives to keep up with modernisation and novel developments (small modular reactors, novel materials, etc.), as well as keeping up developments and EU collaboration on energy fusion projects.

To achieve the planned innovative goals, cooperation between science, industry, politics and society will be required. Considering what should be done to attain the benefits expected by the society and industry from the NPOV, several relevant key factors, and how they influence and cause future industry changes, need to be evaluated:

* Increase in Computer power and Data amount,
* Improvements in Productivity with Artificial Intelligence,
* Automation of processes with Robotics,
* Trends in increasing Human Longevity,
* Implementation of Sustainable Economy.

The effect of these factors on economy should be analysed with respect to:

* Which sectors of the economy will be to what degree affected, and how large part of the economy it represents.
* How high is the potential for Efficiency improvements and Market increases of each economy sector, evaluating the value added through expected technological developments.
* At the same time, how high is the Potential for future Disruptions in the present production of each sector of Czech industry, in view of the emerging new key technologies, benefit/cost analysis to prioritize applications of AI that offer most benefits to CR

These analyses can identify the economy sectors with potential for strong growth and for relatively small risks of future production disruptions. The sectors identified with risks for future production should alert the management to start the needed innovations.

One of the key points in supporting innovations is to provide support and good conditions for Start-up companies. In this respect, ideas for facilitating this process could be found in the successful US program. The US has a very large effort directed at training researchers (PhD students through faculty) to recognize their findings that might translate to marketable products or services, and to educate them on the first steps toward entrepreneurship using the scientific method. Thousands have been trained in the past ~15 years and many successful small businesses or licensing arrangements have resulted. The largest and oldest program is from US National Science Foundation, called Innovation Corps (I-Corps: https://www.nsf.gov/funding/initiatives/i-corps). Its principles could be evaluated for their suitability for a Czech version.

Among other critical points are projects for development of new materials (e.g. materials which could replace the Rare Earth, necessary for production of electronic devices, scarce in supply and expensive). To replace in the future the electronic chips, which in applications of Artificial Intelligence, Data Banks and quantum computing require increasingly high energy power, novel photonic chips and micro laser technologies are being developed, which operate with much lower energy requirements. **In general, as a rule,** any applications of AI developed and considered must be done under human control and check.

To Chapter III - Societal confidence in democratic systems

1. Members of the ISAB would wish to see a general commitment to academic freedom as a key element of any government strategy on research development. This has become crucial to supporting trust in science and scholarship as well as trust in democracy and resilience of society. Recent developments in the world highlight the urgence of this issue.

2. It would be interesting to see how the NPOV document links up with the European ERA policy agenda 2025-2027, and with the recent policy document in Germany.

3. ISAB stresses the expertise in studying the societal effects of technological changes as the Czech system’s major strength worth more central position and support.

To Chapter IV – Preventive healthcare

While the document presents many valuable objectives, such as data collection, analysis, and the development of supporting technologies, these are largely passive goals. There is relatively little emphasis on research activities that proactively guide and shape the future of Czech research. If the main purpose of the report is to equip policymakers with tools and insights to respond to societal, cultural, and environmental trends, then it achieves this aim effectively.

However, as a guide for prioritizing the most productive and impactful research directions, the report offers only broad and general recommendations. Greater specificity regarding which research areas the government considers innovative and strategic, would help clarify funding priorities and orient educational and training efforts for the next generation of scientists, researchers, and entrepreneurs.

Medicine and healthcare will become increasingly important in Czech society with the anticipated rise in the aging population. The proposal appropriately emphasizes advanced data collection, analysis, evaluation, and interpretation of healthcare trends—an area requiring strengthened sociological and public health sciences. At the same time, it is essential to balance this focus with a strongly stated commitment to basic molecular, cellular, genetic, and biochemical research. These are the areas with greatest potential impacts on healthcare, the society and economy, areas where most innovations and breakthroughs in medicine and therapeutic development can be anticipated.

Czech science has a strong legacy of success in microbiology, biochemistry and organic chemistry, and it is important that the NPOV report clearly communicates a commitment to strengthening and advancing medicinal chemistry as a strategic priority. In parallel, the Czech Republic must begin training the next generation of scientists and entrepreneurs to participate fully in additional –rapidly advancing fields of **modern biomedical research**. Among these the highlights are the following:

* Applications of modern Artificial Intelligence Modules to Healthcare (diagnostics, drug development, proposal of therapies, eventually proposals of laboratory experiments to be carried out, revealing connections and deductions not obvious at first sight).
* Disease modelling and therapeutics discovery programs (e.g. human cell-based models of disease, mechanisms of disease, genetic and molecular screening platforms)
* Genetics and gene therapies (e.g. genomic diagnostics, antisense oligonucleotides, mRNA-based vaccines and gene delivery, CRISPR-based editing, viral vector-based gene therapies)
* Engineered cell therapies (e.g. CAR-T therapies for oncology, pluripotent stem cell–derived transplants for neurological diseases and tissue repair)
* Brain-computer interfaces (e.g. biocompatible materials, machine learning applications, advanced wearables)
* Efficient break up of plastics polluting the environment, either chemically or by finding (designing) microorganisms which could do this cost effective
* The analysis of wastewater provides a method for monitoring, prevention and warning of potential pandemics for healthcare. Analysis of wastewater enables to detect and quantify the presence of bio pollutants like viruses, microbial species, protozoa. For rapid development of vaccines for diseases caused by these bio pollutants, their determined DNA/RNA Sequences can be transferred directly to pharma companies for processing.
* This system also enables to detect in water the rests of hormones, medicaments products, micro- and nano- particles, and other relevant micropollutants (Amisulpride, Benzotriazole, 4,5-Methylbenzotriazole, Carbamazepine, Clarithromycin, Citalopram, Candesartan, Diclofenac, Hydrochlorothiazide, Irbesartan, Metoprolol, and Venlafaxine). Its use in Czech Republic should be extended.

Given the high costs associated with these emerging technologies, prioritizing strategic investment in these areas represents not only a scientific necessity but also a forward-looking societal commitment to innovation and healthcare resilience.

**Specific Comments to the NPOV Draft**

(ISAB comments are inserted in green colour)

Oriented research creates a knowledge base for solving identified or anticipated problems. It includes oriented basic research, applied research and experimental development to exploit such solutions. It links basic and applied research to translate knowledge into practice and solve major current societal problems.

The National Priorities of Oriented Research (NPOV) document is a concise overview of strategic research objectives and key topics to serve the actors in the R&D&I system, in the sphere of strategic political decision-making and the wider public. The Annex will include a detailed description of the objectives and an overview of specific sub-topics.

NPOVs will constitute a criterion in the following areas:

* evaluation of large research infrastructures and testing and experimental infrastructures
* involvement of the Czech Republic in European partnerships
* setting the focus of relevant bilateral and multilateral cooperation programmes,
* setting the focus of relevant newly approved targeted support R&D&I programmes, including operational programmes
* determining the research focus of departmental research organisations in accordance with departmental R&D&I concepts
* formulation of R&D&I priorities in the Czech Republic as a basis for public decision makers
* formulation of Czech research priorities in negotiations on the direction of research in the EU

I. Energy Transition and Sustainable Future

Strategic objectives for research, development and innovation

I.1 Advanced materials for low-emission energy

* Advanced construction materials
* New efficient materials for higher energy efficiency and nuclear power.

It would be of interest to know what kind of materials is meant (insulator preventing waste of heat energy? or material enabling to achieve higher efficiency in nuclear plant?), and what the expected objective for the improvement of higher efficiency is.

* New materials for hydrogen production from renewable energy sources

Since the renewable energy sources (solar, wind, hydro, geothermal, biomass, others) may demand different materials, they could be listed for each of the energy production source.

* Increasing the efficiency of photovoltaic cells
* Assessing the properties of (new) materials and evaluating the residual life of components

Increasing the present efficiency level to which expected efficiency?

Which new photovoltaic materials are meant (for example new photovoltaic devices based on other materials than silicon?)

I.2 Low-emission technologies for non-nuclear energy conversion

* Increasing the efficiency of converting renewable and low-emission sources into useful forms of energy

It would be useful to specify the efficiency targets set per each singular energy source.

* Production processes for alternative fuels in the field of thermochemical conversion using waste management

Only thermochemical treatment is mentioned (pyrolysis or gasification?). No biotechnological treatment (bio fermentation: anaerobic or aerobic)?

Also, No photoconversion?

* Distribution and storage of energy from renewable and low-emission sources

This is another important technological point for efficient use of energy.

Whether it is electricity energy (storage in batteries, or molten salts, in pumping water in higher placed reservoirs), or other heat storage method.

How is planned to realise secured Distribution networks with sufficient capacity, able to cope with variations in temporary electricity demand.

* Reducing the environmental impact of fuels

It is not clear which fuels are meant? Carbon-based? Hydrogen? Others?

Which technologies are considered and will be implemented?

I.3 Nuclear energy

It would be useful to know the actual status and the planned development. The sectors of application of SM should be mentioned for clarity.

* Generation III nuclear reactors
* Generation IV nuclear reactors
* Small Modular Reactors (SMR) Generation III and IV

In this field the Czech Republic is at the forefront. It would be interesting to mention collaborations with advanced companies for the Small Modular Reactors SMR.

* Thermonuclear fusion

The Plasma Physics Institute in Czech Academy of Sciences, is contributing to ITER, the international project. Are there other collaborations in this field (e.g. ELI Institute in Prague?)

I.4 Infrastructure and software systems for energy transformation

* New technologies and management of electricity and gas systems, including sector coupling
* Increasing the efficiency and decarbonisation of central heating supply systems

Which new technologies are considered or planned.

* Development of integral energy systems and increasing system flexibility using modern informatics and AI tools

This is a very modern technology goal for an “Intelligent multiagent systems for self-organizing, self-optimizing and self-healing cyber-physical energy systems”.

I.5 Systemic and socio-economic aspects of the energy transition (see also III.3)

* Comprehensive analyses of techno-economic and environmental aspects of the transformation
* Social impacts and public attitudes
* Promoting community resilience

De-carbonisation and de-fossilisation demand a deep analysis of the impact on society and workers of various sector, including re-training and formation to new work opportunities.

How to face this complex problem should be planned in a detailed way:

Analysis is needed of which sectors will be most affected, which infrastructures are necessary besides the existing ones; what solutions are there for each operative sector, etc.

II. Adapting to climate change and mitigating its impacts on society

Strategic objectives for research, development and innovation

II.1 Climate change and monitoring systems

* Modelling tools for long-term climate prediction
* Monitoring of biodiversity and ecosystem services in the Czech Republic

Modern tools for monitoring of water quality and purification techniques are being developed, using advanced filtration methods (with active carbon filters) for production of drinking water quality from wastewater.

* Functional greenhouse gas monitoring systems

Is the system intended to monitor only CO2? Or other components (e.g. H2O).

* Tools for assessing the effectiveness of adaptation and mitigation measures

This requires novel technologies to monitor environment (e.g. drones), hand in hand with introduction and energy production strategies.

II.2 Sustainability of natural resources and their management

* Increasing diversity in urban and agricultural landscapes
* Preventing the spread of invasive species and introduced pathogens
* Circular production and waste minimisation

Here a suggestion is touse the regional biogenic residues for plastics production.

II.3 Adaptation of landscapes and production systems

* Innovative technologies for material recycling
* Combined food and energy production, e.g. agroforestry and agrovoltaics
* Resilient forests and the use of wood as a substitute for fossil materials

It would be useful to compare the annual wood production, with energy consumption in CR.

What fraction of the global energy consumption could be covered by Resilient forests?

* Minimising soil erosion and increasing water retention in the landscape
* Organic farming and biodiversity conservation

One of the factors may be to reduce substantially the plastic discharged into the environment.

* Increasing the resilience of crop production

II.4 Water management and resilience of the water sector

* Reduction of pollutant concentrations

Identification of industrial sectors which pollute water most, search for remedy.

* Reduction of eutrophication of surface waters
* Technology for quaternary wastewater treatment and recycling

Modern tools for monitoring of water quality and purification techniques are being developed, using advanced filtration methods (with active carbon filters, ozonation) for production of drinking water quality from wastewater.

The analysis of wastewater provides a method for monitoring, prevention and warning of potential pandemics for healthcare. Analysis of wastewater enables to detect and quantify the presence of bio pollutants like viruses, microbial species, protozoa. For rapid development of vaccines for diseases caused by these bio pollutants, their determined DNA/RNA Sequences can be transferred directly to pharma companies for processing.

II.5 Resilience of settlements and sustainable mobility

* Blue and green infrastructure in cities

In some European states project Development of “Smart cities”.

* Energy storage pilot projects
* Sustainable transport systems

This could involve electrification, climate-neutral fuels for aircraft, ships and heavy vehicles, autonomous public transport in urban and rural areas.

II.6 Socio-economic and health aspects of adaptation

* Strengthening spontaneous adaptation strategies and their social resources
* Socio-economic impacts of climate change adaptation measures

This may include prevention against natural extreme events (limit flooding, control of riverbeds, soil management, avoiding landslides, mountains security)

* Strengthening the health system and population resilience to the health impacts of climate change

As the temperature increases with resulting milder climate, some infection species move to new locations, where they may cause increases in infection diseases.

Need for increased rate of specialised vaccinations may arise.

III. Trust in democracy and the resilience of society in times of polycrisis

Strategic objectives for research, development and innovation

III.1 Preconditions and sources of individual and social resilience

The competences that impact individual and social resilience could be: life & social skills, emotional intelligence, cognitive bias, mutual understanding and their interdependencies.

* Mental competencies increasing resilience for orientation and communication
* Promoting health and resilience as a prerequisite for the ethical development of individuals, the development of democratic subjectivity and democratic social change
* Individual, community and social resilience and their interrelationship, multisystem resilience

The role and responsibilities of individuals, as well as individual behaviour and collective effects in a society should be stressed.

III.2 Preservation and development of cultural heritage

* Historical and archaeological roots of cultural heritage
* National, regional and local aspects of linguistic, literary and cultural identity
* Care for cultural heritage and areas of historical value
* Cultural and creative industries in the formation of identities, cohesive societies and intercultural understanding
* Migration, enculturation and collective identity

III.3 Social inequalities and their consequences

* Determinants of inequalities
* Social mobility and its barriers
* The impact of inequalities on social cohesion
* Economic impacts of inequalities
* The impact of digital transformation and globalisation on inequalities
* Innovative approaches to reduce inequalities

III.4 Democracy as a complex phenomenon, civic participation and democratic innovation

* Democracy as a political regime, a social and cultural form and a way of life
* Civic and political participation
* Democratic innovation, civic competence and democratic participation

III.5 Institutional and technological aspects of social trust and its crises

* Institutional aspects of society and the state
* Technological change and its impact on society
* Processes of trust and distrust in social and state institutions, elites and values
* Confidence in the institutions of democracy and the rule of law, its crisis and tools for increasing it
* Evidence-based policy development

IV. Preparedness for demographic change, ageing and sustainable health

Strategic objectives for research, development and innovation

The core of this chapter IV should be dealing with the themes like generational gaps, intergenerational dialogue, and with analysis of the needs and trends of new generations, that will live under the change as it currently develops.

IV.1 Demographic behaviour and population development

* Factors influencing individual components of population development
* Preparedness of public systems for an ageing population
* Differences in the demographic behaviour of individual population groups

IV.2 Healthy population and quality of life

Since this is and will become even more important problematics in the not distant future, a large paragraph has been added (see above), with suggestions for some future projects, which existing developments and competences in Czech Republic could make possible.

* Identification and research on determinants of health, effective prevention programmes
* Diagnostics and innovative treatment of chronic, civilisation and rare diseases
* Comprehensive care for the ageing population, multimorbidity and polypharmacotherapy

In this chapter IV should also be included the growing occurrence of mental illness, psychiatric conditions and age-related dementia, and the special needs associated with them.

In the future, an ideal system would allow a person to speak to it about themselves, and the system ideally would be able to identify problems, propose suitable treatment and therapy.

* Mental health as a key aspect of public health

Projects for study of causes and risks for Mental diseases.

IV.3 Availability and quality of health and social services

Plans are need for education and preparation of social-, health-operators, and care takers. At present the main load is on the family members, who assist their relatives. The reality situations show that family members themselves need a support, mental and financial.

* Efficiency, modernisation and resilience of health and social services
* Skills and expertise needed to provide health and social care
* Availability and quality of health and social services
* Equity in access to health care, health inequalities between regions and social groups and strategies to reduce them

IV.4 Labour market and education

System changes with the advent of Artificial Intelligence, and its effect on employment, resulting in a need for a person to re-train more often during life.

* Macroeconomic context of demographic trends and population ageing
* Socio-economic risks at different stages of the working cycle and for different groups of the working population
* Institutional changes and labour market policies
* Education system, lifelong learning

IV.5 New technologies for adaptation to demographic change

Upskilling of teachers and educators is a key issue: they should be prepared to drive young people to the new reality and to manage special needs of those who need support.

* Personalised and digital medicine, including the use of artificial intelligence, biomedical data and technology in patient care, new diagnostic procedures
* New technologies to support the mobilisation, mobility and independence of people with special needs
* Expert and communication systems to support diagnosis, therapy and personalised health and social care
* Innovative medicines and devices applicable to health and social care, including telemedicine, robotics and automation
* New technologies for pharmaceuticals, health and social care and quality of life

IV.6 Value paradigm in the era of demographic changes in the Czech Republic

* Family structures, intergenerational solidarity and changing values, values and the labour market
* Human values, technology and ageing: the digital divide, mental health in an ageing population, active ageing
* Ethical and legal aspects of the use of new technologies, data and patient autonomy

V. Technological and digital transformation of society

Strategic objectives for research, development and innovation

V.1 Intelligent systems for automation of production, logistics, transport, etc. processes and operations for Industry 4.0

* Intelligent systems for flexible and efficient production

ISAB suggests renaming this goal: Intelligent and interconnected systems for flexible and efficient production.

This is very competitive field, and a crucial point for European industry!

Possible future goals:

* Zero-defect production based on neuro-symbolic sensor interpretation.
* Digital twins and semantic product memories for sustainable supply chain management
* Agile manufacturing for mobile ad hoc factories based on the machine-as-a-service paradigm using AI Cloud computing systems (e.g. for reconstruction of factories, after destruction during earthquakes, or war actions)
* Predictive maintenance and operational safety of systems
* Human-machine interaction
* Advanced technologies and production processes
* Automated systems for transport and industrial applications
* Developing space applications for economy and security

V.2 Technologies and processes in semiconductors and their applications

* New semiconductor materials and structures
* New semiconductor solutions for smart technologies
* New technologies for semiconductor design
* New technologies for the production of semiconductor materials and components
* Chip encapsulation and design of modules and integrated solutions

Some suggestions for future development in this field could be :

--- Chiplet design for multiple AI accelerators on a chip

--- System on a Wafer (SOW) design for AI chips with less energy consumption and higher

--- speed for HPCs and AI Gigafactories

V.3 Quantum technologies and their applications

* Technology for quantum computers
* Quantum communications and data security and protection
* Quantum chips, quantum sensors and quantum metrology

V.4 New materials for industrial independence (see also I. 1)

* Nanomaterials

As Czech Republic has developed a long tradition in development and industrial production in this field, it would be interesting to specify fields of application of such nanomaterials

* Composite materials

Mentioning new generation of high-performance composites, bio-based, recyclable, efficient, automated production

* Biomaterials

Are here meant Bio-based materials, (they are different from Biomaterials), or biocompatible materials, or bio-based materials, Bio-based plastics and composites for technical applications

* Recyclable and eco-friendly materials
* New and alternative materials (compounds) for the chemical and pharmaceutical industry
* New generations of traditional materials
* Hybrid technology for shape and surface modification of materials

V.5 Technologies and processes in the field of artificial intelligence and its applications, including cybersecurity

* Development of basic principles and methods of artificial intelligence

Additional suggestion here may be the development of Neuro-symbolic AI methods for the combination of large language models and knowledge graphs for explainable AI.

* AI in industry, energy and transport
* AI and its role in health care and biotechnology
* AI in agriculture and environmental protection
* AI automation in manufacturing and industrial systems (see also VI.3)
* Cybersecurity in autonomous vehicles and smart transport infrastructure
* Further suggestions for development and application in this field :
* A new generation of drones for deliveries in retail or for pest control in agriculture.
* Czech National Research Data Infrastructure (NRDI) as a federated system to distribute

annotated and curated open data for research and applications of machine learning, that is networked with the European data ecosystem

* Embodied AI and virtual dialog partners
* Autonomous systems with humans in the loop for cars, aircrafts and ships.
* Interoperable and open AI standards and interfaces, free training data and open source

software solutions

* Holonic multiagent systems combined with Large Language Models, Large Action

Models and Large Process Models for next generation AI systems

V.6 Education and motivation of technical/technological staff

* Curriculum and teaching methods

Here should be stressed the need of new education curricula that are adapted to generate and manage innovation

* Removing barriers to access to STEM fields
* Predictive models of job development
* Effectiveness of teaching models
* Motivation for STEM education and industry involvement in the development of STEM education

V.7 Space technologies and applications in economic sectors and security

* Preparation of critical and advanced technologies for use in space and space systems
* Development of space applications for broad economic and security applications

VI. Comprehensive response to internal and external security threats

Strategic objectives for research, development and innovation

Since this is a sensitive subject, not much information is expected about developments of software and hardware (e.g. radar systems for localization of objects, cyber protection methods, etc).

VI.1 Security as a complex result of protection against external and internal threats

* Comprehensive understanding of security (cyber, economic, information, environmental, energy, fire, transport, food, health...)
* Radicalisation of communities and individuals in the light of advanced digital technologies
* Enforcement of the law and development of the knowledge and skills of competent authorities and institutions
* Crisis management and resilience of social structures and individuals

VI.2 External security threats and their management

* Breakthrough Technologies and Methods in Individual Operational Domains of Armed Conflict
* Two-way knowledge and technology transfer between research organisations, business and the defence sector
* Coping with modern chemical, biological, nuclear and radiological (CBRN) threats
* Deterrence capabilities and defence against hostile hybrid action and cognitive warfare at national and allied EU/NATO level
* Risks of technology failure in dual-use manufacturing and logistics associated with industrial accidents

VI.3 Internal security threats and their management

* Security needs of the company in individual areas, sectors and industries
* Technological developments and their impact on security risks and related comprehensive protection of critical infrastructure
* Protecting innovation and research knowledge against the risks of intense economic scompetition

1. Data security and protection in AI and quantum technologies
2. Ensuring cyber security of connected systems
3. Quantum Secure Distribution Networks for Critical Infrastructure Protection

VI.4 Innovative responses to new security threats

* Economic and social security factors and their impact on the security and stability of the state and regions
* Societal acceptance of advanced security and defence technologies, especially those based on artificial intelligence

Tools for working with protected information in R&D&I