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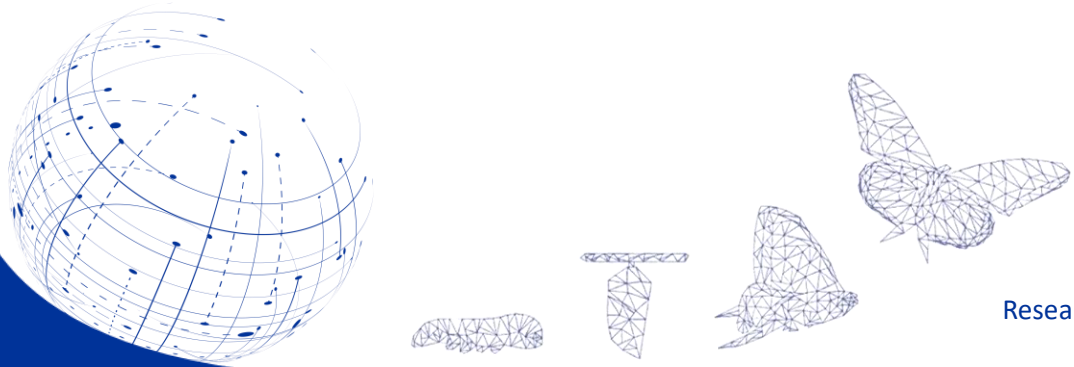
LUKE Joint Call:

TOPIC DESCRIPTIONS



Research and innovation cooperation
with added value

PROJECT INFORMATION

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DLR Projektträger
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Responsible for implementation of the capacity building

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Germany

Romania

R&I Funding Agencies

NATIONAL RESEARCH FOUNDATION OF UKRAINE
Ukraine

T A C R
Czechia

FWF Austrian Science Fund
Austria

FFG Promoting Innovation.
Austria

Latvian Council of Science
Latvia

Estonian Research Council
Estonia

NATIONAL SCIENCE CENTRE POLAND
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Romania

ANCD
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DFG Deutsche Forschungsgemeinschaft
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Germany

Swiss National Science Foundation
Switzerland

Research Council of Finland
Finland

GEORGIA'S INNOVATION & TECHNOLOGY AGENCY
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INTRODUCTION

The definition of the R&I topics to be funded under the LUKE Joint Call followed a structured and participatory approach. The process began with aligning the strategic priorities of the EU, Ukraine and the other countries participating in the call. Building on an analysis of current R&I trends, a visioning workshop involving Ukrainian citizens helped identify needs and expectations. After that in an online survey being open from 15th July – 15th August the funding organisations had the time to rank possible funding topics that were selected based on the findings of the scoping study, the trend analysis and the citizen visioning workshop. Funding organsiation could also state which of the topics are in line with the national programmes. Next, in consultation with the funding organisations represented in the Group of Funding Parties on their September meeting (10th September), four overarching thematic areas were defined: Energy, IT, Health, and Social Sciences and Humanities (SSH) and an initial set of potential topics was proposed.

After that, these initial topics were further refined and complemented with detailed descriptions through participatory expert workshops involving researchers and innovation actors nominated by the Group of Funding Parties for each thematic area. On 20th and 22nd of October 2025, four online expert workshops were held to finalise the call topics in the four fields selected for the LUKE Joint Call: Energy, IT & Cybersecurity, Health and SSH. The workshops were organised and moderated by the LUKE partner Centre for Social Innovation, ZSI, Austria and supported by DLR Project Management Agency, Germany and the Institute for Economics and Forecasting, National Academy of Sciences of Ukraine, IEF NASU.

The workshops were organised to ensure that perspectives from Ukraine and all other participating countries were represented in a balanced way. Each workshop involved at least two Ukrainian experts and up to seven experts from other countries. The workshops emphasised that the selected topics should cover both basic and applied research and foster interdisciplinarity.

Defined LUKE Joint Call topics:

Energy: Sustainable and renewable energy and energy security
IT & Cybersecurity: Cyber resilience of critical infrastructures and adaptive cybersecurity systems
Medical and health research: Telemedicine and biomedical research
- Sub-topic 1: Adoption of telemedicine for remote healthcare solutions
- Sub-topic 2: Innovative research on cellular signaling pathways for biomedical applications

Social Sciences and Humanities (SSH): Social reconciliation, sustainable social development, and human capital restoration

In this document, the specific topic descriptions are provided in the subsequent sections, each dedicated to a single topic.

TOPIC 1: SUSTAINABLE AND RENEWABLE ENERGY & ENERGY SECURITY

Background /Challenge description

Energy security has become a top priority for Ukraine as the war exposes significant vulnerabilities in its energy infrastructure, which is frequently targeted by Russian air-strikes. In order to ensure a continuous and reliable energy supply under these challenging conditions, it is necessary to adopt a systemic approach that enhances both resilience and flexibility. The most rational strategy in this context is the transition towards distributed generation, which allows, when required, the isolation of specific areas from the national grid while maintaining their autonomous operation. Such decentralisation strengthens the overall security of supply and reduces the risk of large-scale power disruptions.

However, reliance on fossil fuel-based generation for these distributed systems would not only be economically inefficient but also inconsistent with the broader energy and climate policies pursued by Ukraine and the European Union. Consequently, a transition to renewable and locally available energy resources becomes essential. Technologies such as solar photovoltaics, wind turbines, small-scale hydroelectric systems, and bioenergy, complemented by the emerging use of synthetic fuels and hydrogen, are particularly suited to regional and community-level applications. These solutions enable the formation of flexible, sustainable, and low-carbon energy networks capable of adapting to dynamic operating conditions.

Scope

We invite proposals for enhancing **energy efficiency, generating renewable energy, sustainability, and energy security** through the implementation of innovative energy-saving electrotechnologies and integrated renewable energy systems.

Proposals may focus on the design, modelling, and optimisation of **smart grid technologies** capable of dynamically balancing the production, storage, and consumption of energy from diverse renewable sources — including solar, wind, hydro, and bioenergy – and on the integration of electric vehicle **charging infrastructure** as a flexible element for grid stabilisation and energy storage.

Projects are encouraged to explore the application of **artificial intelligence (AI) and machine learning algorithms** for real-time forecasting of energy production and demand, optimisation of energy flows, and reduction of network losses.

Proposals should contribute to the **resilience of energy infrastructure,** whereby the resilience of end-users should be strengthened, and cost-effective solutions should be in focus. Improvements of existing energy systems and resilience of critical infrastructure should be prioritised. This may include the development of **decentralised microgrids** capable of autonomous operation during crises or post-conflict recovery, the development of **containerised solutions** (e.g. for hospitals), **distributed systems**,

small energy hubs, environmentally safe **storage technologies**, and the implementation of robust **cybersecurity solutions** to protect energy systems.

Application of the solutions, and small scale demonstration in the frame of case studies can be included in projects, as a quick knowledge transfer and deployment are required. Up-scaling should be considered with additional resources beyond the project. Different sectors can be targeted, such as the **public sector** (e.g. hospitals, heating systems), and research addressing **energy-efficient electrotechnological processes in industry and transport** where it leads to measurable reductions in energy intensity and heat losses.

Proposals should include **evaluation and assessment**, such as techno-economic and socio-economic analysis on implementing renewable energy systems, and the application of **Life Cycle Assessment** (**LCA)** methodologies to enhance the environmental performance of energy systems within the framework of the circular economy. Evaluation and assessment shall give ideas to which actions are most feasible under local and regional conditions and can provide timelines for their implementation. Results can feed then into strategies and holistic approaches for the future energy system of Ukraine.

TOPIC 2: CYBERSECURITY - CYBER RESILIENCE OF CRITICAL INFRASTRUCTURE & ADAPTIVE CYBERSECURITY SYSTEMS

Background /Challenge description

This research topic seeks to support Ukraine's digital and scientific integration with the European Research Area by promoting cutting-edge research on cyber-security. Cyber-security is a foundational pillar of modern national resilience, economic stability, and democratic governance. In the face of escalating cyber threats, hybrid warfare, and the rapid evolution of digital technologies, coordinated research and innovation in cyber security is essential.

Scope

This topic aims to strengthen cyber resilience by fostering interdisciplinary and cross-sectoral research that addresses **emerging risks linked to AI spoofing, quantum computing, and digital fraud**. It supports the development of **advanced cybersecurity technologies, including AI-based threat detection, post-quantum cryptography, and blockchain-enabled trust mechanisms**, to ensure the robustness and sovereignty of digital infrastructure.

Proposals should address the **societal aspects of these emerging risks and cybersecurity technologies.** Strengthening cybersecurity requires not only technological advancement but also the establishment of cybersecurity as a collective social practice. This entails enabling the wider population to participate in preventive measures and to recognise and withstand social engineering and manipulation. In parallel, organisations, institutions, and communities bear a crucial responsibility in creating conditions that facilitate secure behaviour, including through appropriate organisational procedures, clear communication, and trustworthy infrastructures. Furthermore, cybersecurity solutions - such as digital identity systems - must be designed to be inclusive and accessible to all social groups, in order to prevent exclusion and reduce vulnerability to digital fraud.

Possible **applications and case studies** could be: cybersecurity for critical infrastructure and key technologies such as drones, aircraft, airports, railway stations and trains, electricity and power stations, and e-health; cybersecurity for environmental monitoring and early warning systems such as for water and flood forecasting. Other cases are also possible.

The expected outcome of this topic is an enhanced capacity to anticipate, prevent, and respond to complex cyber threats, thereby contributing to a secure, trustworthy, and technologically independent digital ecosystem.

TOPIC 3: MEDICAL & HEALTH RESEARCH: TELEMEDICINE, BIOMEDICAL RESEARCH

Background /Challenge description

The Ukrainian healthcare sector is confronting unprecedented pressures as it strives to meet immediate wartime demands while addressing long-term public health challenges. Innovations are emerging to support recovery and mitigate the impacts of conflict. The transformation is marked by the growing adoption of telemedicine and remote healthcare solutions, which have expanded access to critical services in underserved areas. Another important research and innovation strand for Ukraine is biomedical research, which is advancing diagnostic capabilities and fostering the development of cutting-edge treatment methods for major diseases.

Scope

Sub-topic 3.1: Adoption of telemedicine for remote healthcare solutions

This topic focuses on the development of personalised **AI-powered telediagnostic platforms** for remote decision-making by doctors and patients. It implies the creation of **software and hardware and the use of artificial intelligence algorithms**. Telemedicine shall **expand diagnostic capabilities, improve treatment, predict and prevent possible complications, and ensure individualised rehabilitation** for patients. Telemedicine proposals can cover injuries and functional impairments, and different diseases, such as those affecting the cardiovascular, nervous, and pulmonary systems, women's health issues, the musculoskeletal system, and others. Telemedicine shall facilitate the connection between patients and doctors in remote areas and regions with restricted access to medical services. It should also enable real-time collaboration between Ukrainian and international medical teams to strengthen cooperation in diagnostics, rehabilitation, and knowledge exchange.

A sub-topic that connects both to telemedicine and psychosocial research (see Social Sciences and Humanities - SSH topics), is the application of electroencephalography (EEG) in the diagnosis of post-traumatic stress disorder (PTSD). AI-driven approaches for EEG signal analysis should be investigated, which will support, enhance, and automate EEG-based decision-making and interpretation on PTSD. We encourage proposals to be submitted by multidisciplinary teams involving specifically groups from SSH.

Sub-topic 3.2: Innovative research on cellular signaling pathways for biomedical applications

Proposals are invited for innovative research on cellular signaling pathways for biomedical applications. Biomedical research under this topic should **advance diagnostic capabilities and treatment methods**. Proposals should focus on analysis of possible ways to address **resistance to antibiotics, or focus on diagnostics and treatment for cancer or neurodegeneration**. Studies of the **molecular basis of alterations in signaling networks in human pathology** will provide valuable novel biomarkers fostering the development of cutting-edge solutions for the diagnosis and therapy of human diseases.

TOPIC 4: SOCIAL SCIENCES AND HUMANITIES (SSH): SOCIAL RECONCILIATION, SUSTAINABLE SOCIAL DEVELOPMENT AND HUMAN CAPITAL RESTORATION

Background /Challenge description

Investing in Social Sciences and Humanities (SSH) is vital for Ukraine to understand and navigate its post-conflict recovery, inform evidence-based policymaking, and strengthen the social fabric. This research field integrates analyses of social reconciliation, sustainable social development and human capital restoration, which will ensure that strategies for growth, reintegration of displaced populations, and rebuilding trust in institutions are grounded in rigorous, context specific knowledge.

Scope

Under the topic of **social reconciliation, sustainable social development, and human capital restoration,** proposals are invited, which address one or more of the following issues:

- The first issue concerns **social inclusion and minimising disadvantage** based on ethnicity, gender, age, religious believes and physical and mental ability. An important challenge to be investigated here is the **reintegration of people displaced by armed conflict.** Items suggested for research in this context are **intergroup relations and gender dimensions, including policy development,** as well as the relationship between **social inclusion, mental health, and improving access to mental health resources for disadvantaged populations.**
- A second issue concerns sustainable social development, which requires research on strengthening **cultural and digital literacies** among the population, and developing **evidence-based cultures of remembrance**.
- A third issues concerns **studying how communities recover after trauma**, how trust between people, institutions, and the state can be rebuilt, and how psychological stability transforms into a social resource. Equally relevant is the study of **post-traumatic social dynamics** – how war-related trauma, loss, and forced displacement reshape patterns of trust, institutional functioning, and the role of culture and education in recovery.
- A fourth issue concerns the **labour market,** which is marked by challenges around **skills development, demography and ageing, and migration**. Studies of this issue should include an **assessment of the economy's potential need for labour in terms of quantity and quality,** the possibility of meeting this need through the return of military migrants, return migration, and the attraction of immigrants from other countries. An assessment of the state of human capital, providing skills for migrants, and skill development (e.g. via educational programmes) may be investigated as well. Recommendations for improving policies on human capital restoration should be generated.