Newsletter

pICTure

Policy dialogue in ICT to an Upper level for Reinforced EU-EECA Cooperation

#4 May 2014

EU-Eastern Europe and Central Asia Gateway for ICT Research, Development and Policy Dialogue
http://www.eeca-ict.eu/

From the editor

Svetlana Klessova, PICTURE project coordinator Director, Inno TSD (France)

>>READ MORE>>>

Outcomes and lessons learnt

The project PICTURE was an ambitious support action with the overall aim to engage the EU and EECA stakeholders from across research, academia, industries, government and civil society to enrich and support the EU-EECA ICT Policy Dialogue, and to reinforce strategic partnerships between EU and EECA ICT organizations.

PICTURE has a number of strong outcomes that will be presented at the final dissemination conference of the project in Minsk, Belarus, on May 21, 2014. >>READ MORE>>>

Two roadmaps in the focus

ROADMAP: common research priorities between relevant European Technology Platforms and the EECA region in the field content technologies and information management

ROADMAP: common research priorities between relevant ETPs and the EECA region in the field of components, computing systems and networks

>>READ MORE>>>

EVENT IN MINSK: PICTURE Final Dissemination Event

>>READ MORE>>>

Need for information system

Within the PICTURE Project aiming at further strengthening of ICT R&D cooperation among stakeholders, some specific activities were performed in order to provide the project with strategic vision regarding the EU-EECA ICT collaboration. >>READ MORE>>>

Success examples of PICTURE

UKRAINE: PICTURE and new trends of developing the dialogue between Ukraine and the EU in ICT

KAZAKHSTAN: Development of the Targeted Technological Programs mechanism

TAJIKISTAN: Establishing of new ICT priorities and new ICT NCP

RUSSIA: Taking new PICTURE in cooperation between Russian Technology Platforms and European Technology Platforms

>>READ MORE>>>

Information and communication technologies open calls in HORIZON 2020

HORIZON 2020 is the new EU funding programme for research and innovation running from 2014 to 2020 with around €80 billion budget.

>>READ MORE>>>

TWO NEW PROJECTS STARTED, to support EU-EECA ICT collaboration

EECA-2-HORIZON: "Bringing the EU-EECA Cooperation and Policy Dialog in ICT in the HORIZON 2020"

EAST-HORIZON: "Fostering Dialogue and Cooperation between the EU and EECA in the HORIZON 2020 perspective"

>>READ MORE>>>

From the editor

Svetlana Klessova,
PICTURE project
coordinator
Director, Inno TSD
(France)

Dear readers,

We are pleased to welcome you once again to the pages of the forth, and last, PICTURE project newsletter. For the last years, the European Commission has undertaken particular efforts to reinforce the ICT Policy and Research, Development & Innovation strategic partnership between the European Union and the Eastern Europe and Central Asia (EECA) countries. The PICTURE project lasted 30 months and had a mandate to provide policy dialogue support and to reinforce cooperation links between EECA and EU networks. The two new projects – EECA2HORIZON and EAST HORIZON – were launched in February 2014, to continue the support the ICT EU-EECA collaboration. The EU-EECA Gateway for ICT Research, Development and Policy Dialogue www.eeca-ict.eu remains the portal for the new projects.

This newsletter will bring you fresh insights about a number of PICTURE latest activities, outcomes and success stories. You will read about the two roadmaps "Common research priorities between relevant European Technology Platforms and the EECA region" in the fields of "Components, Computing Systems and Networks" and "Content Technologies and Information Management", developed by the PICTURE project team with the support of Working Group members coming from all EECA countries. You will learn about the information system for which the need emerged and that is planned to be set up during the next year. We also wanted to share with you some PICTURE project highlights and success stories, as well as the information about the upcoming ICT Call Horizon 2020.

We would also like to express our appreciation with all those working within the PICTURE project: Working Group members, ICT stakeholders, representatives of innovation infrastructure, policy makers, EC representatives, project partners… It has been rewarding, interesting and hopefully fruitful experience.

Thank you – and we look forward to working with you in the future, for the benefits of EU-EECA ICT research, development and policy dialogue.

Outcomes and lessons learnt

The project PICTURE was an ambitious support action with the overall aim to engage the EU and EECA stakeholders from across research, academia, industries, government and civil society to enrich and support the EU-EECA ICT Policy Dialogue, and to reinforce strategic partnerships between EU and EECA ICT organizations.

PICTURE has a number of strong outcomes that will be presented at the final dissemination conference of the project in Minsk, Belarus, on May 21 2014. They include, for example:

- **The contribution to ICT Research, Development and Innovation Policy Dialogue** - both inside the EECA countries and between the EU and the EECA region. This work was done with active involvement of Working Group members from all around EECA. Reports developed by the project have been used in several EECA countries as background

documents for policy dialogue activities, in the preparations for the policy dialogue meetings, for example. In Georgia, PICTURE documents (EECA ICT priorities, trends in ICT policy, etc) were used during the elaboration process of future innovation policy organized by World Bank. In other countries – such as Central Asia region - this work created awareness about ICT policy issues with regard to collaboration, and the impact is expected in longer term perspective.

■ **The recommendations to the EC about ICT R&D priorities for EU-EECA collaboration.** At the request of the European Commission, the PICTURE project team prepared a list of topics recommended for possible upcoming EU-EECA calls.

■ **Two roadmaps "Common research priorities between relevant European Technology Platforms and the EECA region"** were prepared, discussed and agreed with the Working Groups: these roadmaps are on the topics "Components, Computing Systems and Networks" and "Content Technologies and Information Management".

■ **The establishment of cooperative links** between successful EU initiatives (such as European Technology Platforms) and similar structures and organizations from the EECA region. About 25 EECA organisations became members of European networks as a direct result of PICTURE project implementation. The most active country in PICTURE project with regard to the integration into the European ICT networks was Ukraine: during the project lifetime, 12 Ukrainian organisations became members of the ICT-related European Technology Platforms NEM, NESSI NET! WORKS; and PHOTONICS 21!

■ **The facilitation of networking activities between EU & EECA organizations**. **10 collaboration and networking events** or activities between EU and EECA ICT RTD organizations have been initiated as a direct result of PICTURE activities. For instance, the

co-organization – together with the EC - of two EC Info-days on ICT in HORIZON 2020 in Ukraine and in Armenia, with over 100 participants from all EECA region in each of them led to an increased understanding of HORIZON 2020 structure, objectives, ICT priorities and rules among the ICT RTD&I communities in the EECA.

■ **Support to ICT market opening**. National initiatives of the EECA counties were supported. For example, the Kazakhstan partner NATD JSC worked with the database of the EU technologies generated by EU FP7 projects (there are about 13 000 technologies including a big part of the ICT) to select 500 technologies of high relevance for Kazakhstan. Then 42 EU technologies have been selected by Kazakhstani companies. This work will continue, and it is expected to contribute to the opening of new markets for EU-developed technologies.

These and other examples are described on the pages of this newsletter in more detail.

The PICTURE partners, experts of the Working Groups and national stakeholders involved in the project activities have identified and analysed the bottlenecks. What should be done better? What are the missing elements? This lead to a set of lessons learnt – they are in discussion between partners and will be presented to the stakeholders at the final PICTURE dissemination event in Minsk, Belarus, on May 21, 2014. The relevant materials will be published after the event on the web portal www.eeca-ict.eu

Two roadmaps in the focus

ROADMAP: COMMON RESEARCH PRIORITIES BETWEEN RELEVANT EUROPEAN TECHNOLOGY PLATFORMS AND THE EECA REGION IN THE FIELD OF CONTENT TECHNOLOGIES AND INFORMATION MANAGEMENT

INTRODUCTION

This document outlines the PICTURE partners' analysis regarding the common research priorities between selected ETPs (e.g. NESSI and NEM) and the EECA region in the HORIZON's 2020 objectives and structure. This document, attempts to identify research areas of mutual interest between relevant ETPs and the EECA region in the field of "Content Technologies and Information Management" to become common ground for future joint activities in the HORIZON 2020. The document is based on:

- the Strategic Research Agendas and relevant documents of the selected ETPs (i.e. Networked European Software and Service Initiative - NESSI and Networked and Electronic Media - NEM);
- the Commission staff working document - strategy for European Technology Platforms: ETP 2020 (12.07.2013);
- the current EECA ICT priorities as they were outlined in PICTURE project deliverable: "Updated report about the EECA ICT priorities";
- Horizon 2020 objectives, structure and Work Programmes.

ETPs NESSI and NEM

NESSI (http://www.nessi-europe.com/default.aspx?page=home) is the European Technology Platform dedicated to Software and Services. Its name stands for the Networked European Software and Services Initiative. NESSI provides a platform to allow industry, research centres and academia to discuss, elaborate and influence technological advancements, competitiveness and sustainability in the field of software and services research and innovation.

In April 2013, NESSI published the **NESSI Strategic Research and Innovation Agenda**

(http://www.nessi-europe.com/Files/Private/NESSI_SRIA_Final.pdf), in which NESSI presents recommendations as key for achieving the ambitious goals set out in Horizon 2020. Recommendations are given with respect to research and innovation priorities for future activities launched in the context of Horizon 2020.

NESSI has identified that Software and Services expertise is comprised mainly in three activity lines:

- Next generation computing: Advanced computing systems and technologies;
- Future Internet: Infrastructures, technologies and services;
- Content technologies and information management: ICT for digital content and creativity.

The NESSI SRA provides recommendations referring to these three activity lines. The recommendations are structured around the seven following focus areas for each of which a set of research and innovation priorities is suggested:

1. Quality in cloud-based heterogeneous service scenarios
2. Services benefiting from Programmable Networks
3. Service usage in a fast changing business world
4. Service and Software Engineering
5. New ways to increase software performance and energy-efficiency
6. Integration of Big Data Analytics into Business processes
7. Trust and security for global digital infrastructures and services

The **Networked and Electronic Media (NEM) Initiative** (http://nem-initiative.org/) aims at building sustainable European leadership in the content of production and networking technologies. Its objective is to promote an innovative European approach to the convergence of media and telecommunications towards a Future Media Internet that will enhance the lives of European citizens through a richer media experience.

The NEM constituency includes all major European organisations working in the networked

and electronic media area, including content providers, broadcasters, network equipment manufacturers, network operators and service providers, academia, standardisation bodies and government institutions. Those actors share a common Vision and have been producing a Strategic Research Agenda (SRA) as well as position papers, in order to accelerate the innovative development of the new sector in a harmonised and fruitful way and to place European industry at the forefront of the information era.

In September 2011, the **NEM Position Paper on Future Research Directions** (http://nem-initiative.org/documents/position-papers/) was updated and complemented with detailed recommendations for future ICT research topics in Horizon 2020. The selection of topics is derived from a survey performed among all NEM members. The topics for which the NEM Community sees a specifically high importance in Horizon 2020 are:

Media-related applications and business models
- Social Networking and Media Sharing
- User Satisfaction and Quality of Experience

Content Creation
- New Forms of Content
- Representation of Content
- Tools for content creation and manipulation

Networking and delivery infrastructure
- Intelligent Delivery

Content search and media presentation
- User-system interaction
- Authentic, true-to-original media reproduction including Virtual Reality

Technology drivers and enabling technologies
- Data security and personal privacy
- Identity management and AAA (authentication, authorisation and accounting)
- Personalisation/profiling: Smart user profiles across all services & devices
- Power management technologies – energy saving in/by ICT
- Machine-Machine Communication.

COMMON RESEARCH PRIORITIES BETWEEN THE SELECTED ETPS AND THE EECA REGION

The project consortium conducted the mapping of common research ICT-priorities based on review of ETPs SRAs, relevant PICTURE project de-

liverables, etc. We have illustrated the identified common research priorities between the relevant ETPs (i.e. NEM and NESSI) and the EECA region following the objectives and structure of Horizon 2020 (http://www.eeca-ict.eu/uploads/new_documents/priorities_map_V3_final_Content.pdf).

For each of the ICT related topics of Horizon 2020 the analysis was conducted on its accordance to the ICT priorities of ETPs and EECA. The ICT priorities in the relevant ETPs are represented in the Strategic Research Agendas. The EECA ICT priorities outlined in project PICTURE deliverable: "Updated report about the EECA ICT priorities.

The conducted analysis indicates that the highest level of accordance and potential for cooperation are in the following topics:

Industrial Leadership
- Next generation computing, Advanced computing systems and technologies
- Future Internet, network infrastructures, technologies and services
- Content technologies and information management, ICT for digital content and creativity

Societal Challenges
- Health, demographic change & wellbeing; e-health, self-management of health, improved diagnostics, improved surveillance, health data collection, active ageing, assisted living
- Inclusive, innovative and secure societies; Digital inclusion; social innovation platforms; e-government services; e-skills and e-learning; e-culture; cyber security; ensuring privacy and protection of human rights on-line

ROADMAP: COMMON RESEARCH PRIORITIES BETWEEN RELEVANT ETPS AND THE EECA REGION IN THE FIELD OF COMPONENTS, COMPUTING SYSTEMS AND NETWORKS

This document, attempts to identify research areas of mutual interest between relevant ETPs and the EECA region in the field of "Components, Computing Systems and Networks" to become common ground for future joint activities in the light of HORIZON 2020. The document is based on:

▲▲HOME▲▲

- the Strategic Research Agendas and relevant documents of the selected ETPs (**NET!WORKS, PHOTONICS21 and ETP4HPC**);
- the Commission staff working document - Strategy for European Technology Platforms: ETP 2020 (12.07.2013);
- the current EECA ICT priorities as they were outlined in PICTURE project deliverable: "Updated report about the EECA ICT priorities" and
- Horizon 2020 objectives, structure and Work Programmes (as they were adopted on December 2013).

ETPs – Net!Works:

Net!Works (http://www.networks-etp.eu/home.html) is the European Technology Platform for communications networks and services. Communications networks enable interaction between users of various types of equipment, either mobile (e.g. mobile phones) or fixed (e.g. PCs); they are the foundation of the Internet. The Net!Works European Technology Platform gathers about 880 players of the communications networks sector: industry leaders, innovative SMEs, and leading academic institutions. The mission of Net!Works is to strengthen Europe's leadership in networking technology and services so that it best serves Europe's citizens and the European economy.

Net!Works priority topics are:
1. Smart Cities, including following 4 areas:
   - E-Government
   - Health, Inclusion and Assisted Living
   - Intelligent Transportation Systems
   - Smart Grids, Energy Efficiency and Environment
2. Spectrum Crunch
3. Networks for the Next Generation of Wireless-Optics Communications
4. Architectures and Management of Future Networks
5. Networks as National Critical Infrastructures
6. Networks for Cloud Computing and Service Platforms

The strategic technologies and research areas that are deemed to collectively address Grand Societal Challenges, users' requirements for communications, telecom industry challenges and market requirements, thus offering the promise of greater economic and societal impacts for Europe are:

- Smart communication systems
- Context-based networking
- User profiling mechanisms and technologies
- Machine-to-machine communications
- Small cell technologies
- Infrastructure sharing
- Support of a fully multi-dimensional approach
- Information centric networks
- Hybrid of optical fibre and wireless technologies
- Optical networks
- New communication technologies
- Systems co-design
- Energy efficient systems
- Standard interfaces
- Trust, security, and privacy

The above mentioned technologies and research areas are not listed in any particular order of priority. They are all considered to be strategically important and their realization should pave the way for a progressive transition to the Future Internet.

ETPs – Photonics21:

Photonics21 (http://www.photonics21.org/) is the European Technology Platform for photonics – one of those technologies which the European Commission in 2009 nominated as "Key Enabling Technologies" (KET's). The platform represents photonics research & innovation priorities at European level and aims to implement a common photonics strategy for Europe.

Photonics21 undertakes to establish Europe as a leader in the development and deployment of Photonics in six industrial areas (Information and Communication, Industrial Manufacturing, Lighting, Displays, Organic Electronics, Life Science & Health, Security, Metrology & Sensors, Optical Components and Systems) as well as in Education and Training.

The table below shows Major Application Fields of Photonics21 and Socio-economic and R&I challenges that each of them are facing.

ETPs – ETP4HPC (http://www.etp4hpc.eu/) :

High Performance Computing (HPC) plays a pivotal role in stimulating Europe's economic growth. HPC is a pervasive tool allowing industry and academia to develop world-class products, services and inventions in order to maintain and reinforce Europe's position on the competitive worldwide arena. HPC is also recognized as crucial in addressing grand societal challenges. "Today, to Out-Compute is to Out-Compete" best describes the role of HPC.

Major Application Fields	Socio-economic challenges	Research and innovation challenges
Information & Communication	• ensuring sustainable development, • securing energy supply, • addressing the needs of an ageing population, • ensuring human and environmental health • employment	• Broadband terrestrial backbones • Optical network and IT convergence • Broadband fibre based access • Optical interconnects lighting the datacentre
Industrial Manufacturing & Quality	• Sustainable development • Reduction in energy consumption • Zero-fault production • Green manufacturing • Addressing needs of healthcare sector and aging population • Employment • Provides competitive advantage to manufacturing industries	• Extending laser processing capabilities • More efficient lasers • Longer-lasting components that can be recycled • Maintenance-free manufacturing equipment • New photon transmission systems • incorporation of adaptive reconfigurable beam delivery networks capable of high power and intensity • high-speed beam deflection technology • improvements in quality control and sensors
Life Science & Health	• Pandemics caused by contamination • Public health • Ageing societies	• Preclinical research • Oncology • Infectious diseases • Ophthalmology • Neuro-monitoring and imaging • Environmental monitoring, food and drug quality and safety
Emerging Lighting, Electronics & Displays	• Health • Clean and efficient energy • Climate action, resource efficiency • Smart, green transport • Inclusive, innovative and secure societies	• LEDs • OLEDs • OPV (Organic Photovoltaics) • Flexible Electronics based on OLAE devices • Displays

▲▲HOME▲▲

Major Application Fields	Socio-economic challenges	Research and innovation challenges
Security, Metrology & Sensors	• Safe and healthy food and water • Clean air • Clean and safe environment • More secure society • Smart transport systems	• EIR (Extended Infrared) sources • EIR photodetectors • CMOS-based single-photon NIR image sensing • Low-cost, high-performance micro-coolers • Passive optical devices • Optical fiber light-guides and sensors • Measurement techniques for processes and production lines • Complete integrated photonic microsystems • Comprehensive photonic solutions for high-impact applications
Design and Manufacturing of Components & Systems	• No specific applications addressed, but numerous of general aspects • Strengthening European industry	• Photonic integration • Integration of photonics with microelectronics • Technologies for cost-effective manufacturing of components and subsystems • Semiconductor optical device technology • Exploitation of new materials
Education, Training & Disruptive Research	• All above challenges in general	• Research • Education and training

Vision
- To build a European world-class HPC technology value chain that will be globally competitive.
- To achieve a critical mass of convergent resources in order to increase the competitiveness of European HPC vendors and solutions.
- To leverage the transformative power of HPC in order to boost European competitiveness in science and business.
- To expand the HPC user base, especially SMEs (through facilitating access to HPC resources and technologies) and to open the possibilities for SMEs to participate in the provision of competitive HPC technology solutions.
- To facilitate the provision of innovative solutions to tackle grand societal challenges in Europe such as climate change, better healthcare, predicting and managing large scale catastrophes and energy-efficiency.
- To foster international cooperation in research and industry.

Mission
- Designing and updating a Strategic Research Agenda (SRA) (http://nem-initiative.org/documents/sra/) to provide decision makers

with relevant advice and expertise for the long term development of HPC in Europe.
- Providing recommendations and support to the implementation of the SRA.
- Facilitating coordination between the HPC ecosystem and public authorities (EU and Member States) responsible for HPC research and dissemination programs.
- Fostering joint initiatives among ETP members and other stakeholders in the area of research and innovation programs.
- Facilitating the emergence of start-ups and the growth of existing SMEs.
- Supporting Europe and Member States authorities by reinforcing Europe's position in the worldwide HPC arena.
- Representing the voice of the European HPC industry in the worldwide HPC arena.

Major challenges addressed

The ETP4HPC's SRA focuses on specific challenges within the four dimensions shown in the figure above. They are the drivers underlying the research topics:
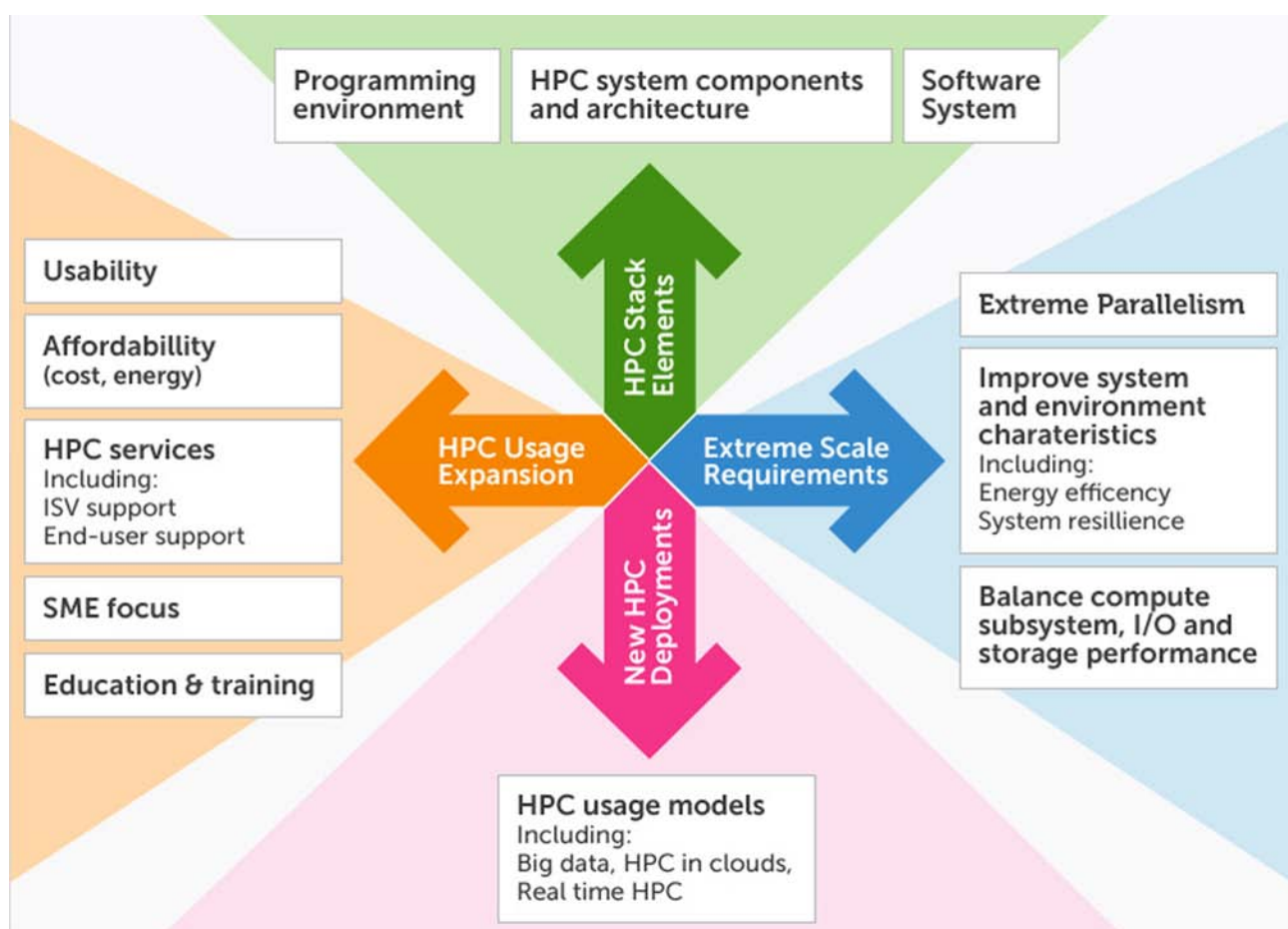
At the System Architecture level:
- Future HPC platform architectures
- Energy cost and power consumption
- I/O latency and bandwidth (memory, inter-connect, and storage)
- Concurrency and data locality
- Extreme scale from sub-component to total system
- Resiliency, Reliability, Availability, Serviceability (RAS)
- The "storage gap" between storage and compute performance

At the System Software level:
- Scalability, modularity, robustness
- Capability for virtualisation
- Extensive system monitoring
- Increased system heterogeneity
- Awareness of data-movement cost

·For the programming environment:
- Hierarchical models
- Data distribution and locality
- Performance analytics
- Emergence of new parallel algorithms
- Awareness of data-movement cost

- Application code migration and re-writing

Related to new HPC usage models:
- Explosion of data volumes ("Big Data")
- Increasing heterogeneity of data
- HPC workloads in cloud computing

Common research priorities between EECA and selected ETPs in the field of Components, Computing Systems and Networks

After combining ETPs research priorities based on their strategic documents and EECA priorities identified by the PICTURE project in the deliverable «Updated report about the EECA ICT priorities» and dividing all of them by the ICT related topics of Horizon2020 the tables mapping above mentioned priorities was elaborated. The future analysis of the table shows that the topics of the highest mutual interest are as follows:

Industrial Leadership
- Next generation computing, Advanced computing systems and technologies (applies only to ETP4HPC)
- Future Internet, network infrastructures, technologies and services
- Micro- nano-electronics and photonics

Societal Challenges
- Health, demographic change & wellbeing; e-health, self management of health, improved diagnostics, improved surveillance, health data collection, active ageing, assisted living
- Secure, clean and efficient energy; Smart cities; Energy efficient buildings; smart electricity grids; smart metering
- Inclusive, innovative and secure societies; Digital inclusion; social innovation platforms; e-government services; e-skills and e-learning; e-culture; cyber security; ensuring privacy and protection of human rights on-line (only excluding ETP4HPC)

The above analysis shows that there are significant opportunities for cooperation between the European Technology Platforms (namely Net!Works, Photonics21 and ETP4HPC) and similar structures and interested stakeholders from the EECA countries (e.g. RTP on Photonics) in the field of "Components, Computing Systems and Networks". The cooperation between the three ETPs and the EECA region should be built around common societal challenges (e.g. e-Health, ageing population, energy efficiency, Smart Cities, intelligent transport systems, e-Government, Cybersecurity) and specific problems / topics.

The current priorities map can serve as a starting point in the development of successful joint proposals for HORIZON 2020 in the ICT area and will be used and updated in the next relevant EU projects.

http://www.eeca-ict.eu/uploads/new_documents/priorities_map_Components.pdf

Need for information system

Within the PICTURE Project aiming at further strengthening of ICT R&D cooperation among stakeholders, some specific activities were performed in order to provide the project with strategic vision regarding the EU-EECA ICT collaboration and connecting the project to key relevant players both in Europe and in the EECA countries.

Three working groups (WG) were created to realize these activities, one of which - **WG1** was focused on implementation of Pilot Action: «**Preparing the ground for the development of an information system to support policy dialogue and cooperation between the EU and the EECA region in the area of ICT R&D**».

In order to understand if there is a real need to create a new information system to support EU-EECA collaboration in the ICT area, the PICTURE consortium lunched an on-line survey that targeted more than 100 ICT EECA specialists from Research and Development Institutions, Ministries, State Agencies, SMEs and other organizations.

The survey showed the clear need for an information system that will support the EU-EECA ICT policy dialogue and ICT cooperation. More spe-
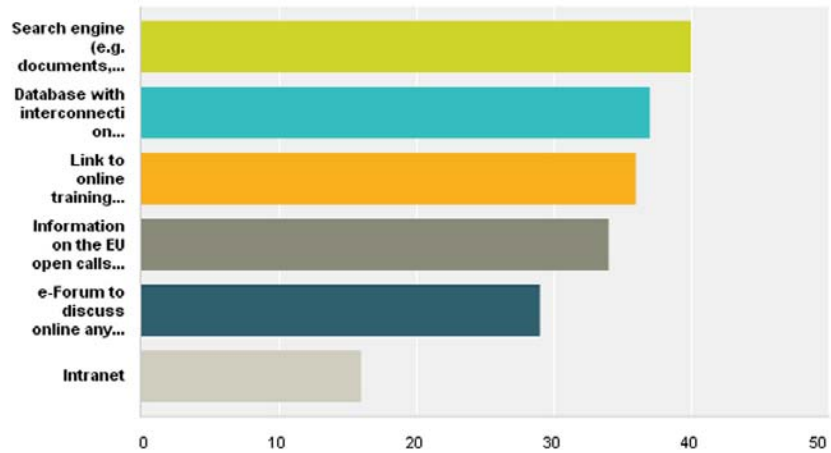
cifically, Pilot Action's activities revealed a common need between EECA project participants for:

- The development of an aggregating information system from different existing information systems.
- The availability of the information on a single point.

The potential users of the ICT EU-EECA policy dialogue and cooperation information system are researchers, engineers, R&D research centres, public authorities, policy makers, SMEs, NGOs, etc. – especially EECA ICT researchers, but also EU-based researchers looking to participate in EECA programmes.

The highest relevance for them is i) database interconnecting EU/EECA ICT actors and R&D programs and ii) information on EU programs that support international collaborative research activities in the field of ICT as well as links to online trainings organized by EU or EECA entities and new projects and collaborative ideas from interested parties.

The existing PICTURE portal (www.eeca-ict.eu) could serve as a main platform for the development of the proposed Information System with a broader portfolio and advanced functions. The content of the new advanced portal could be co-created by users after pre-check and approval of the proposed information before publishing. Registration instrument and special services to the registered users in comparison to non-registered (e.g. – alerts, possibility to add new information about themselves, etc.) could be offered. The new system could have also the option to offer online voting service for potential users.

Some advanced functions of the proposed information system could be: a search engine for programmes, a partner search engine for participation in EECA national programmes, presentation of successful cases of EU-EECA ICT collaborations under EECA RTD&I programmes and an e-Library on the EU-EECA RTD&I cooperation potential in ICT.

Tailor made services could be developed to support organizations in making use of information of a different nature (ICT calls, publications, and web resources of the organisations).

In conclusion, the proposed Information System:

- Will be oriented to facilitate the participation of EU researchers in the National RTD&I Programmes of the EECA countries by providing information on the funding opportunities in EECA and by making available the programme profiles of EECA programmes open for EU actors.
- Can serve also as a platform to facilitate EECA countries participation and partner search activities within the EU Research and Innovation Programme HORIZON 2020 and connected Programmes and instruments such as COST, COSME, JRC, and JPI etc.

- Will provide to potential users help for dissemination of relevant information, contacts of active and experienced participants of projects, possibility to identify more/less active areas of collaboration, easy access to the data for decision makers as well as will encourage newcomers for the first attempt. It will include the calendar of upcoming events and archives of the past events.

The proposed Information System will support the continuation of activities implemented in the PICTURE project and in the current ICT related projects such as IDEALIST, as well as, activities planned within EECA-2-HORIZON and EAST HORIZON.

A new support action project (EECA-2-HORIZON) has included in its activities the development of an Information System with the aim to inform, facilitate interaction and support collaboration towards the formation of strategic partnerships under both EU and EECA RTD&I programmes. The above Information System will utilize the work done under PICTURE in the framework of the aforementioned Pilot Action (http://www.eeca-ict.eu/uploads/new_documents/specifications_of_infosystem_for_portal.pdf)

▲▲HOME▲▲

EVENT IN MINSK: PICTURE Final Dissemination Event

The final conference presenting the main results of the FP7 project "Policy dialogue in ICT to an Upper level for Reinforced EU-EECA Cooperation" (PICTURE) will be held on May 21st, 2014 in Minsk, Belarus.

Conference participants will be representatives from the **European Union, Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan** from

- European Technological Platforms
- public and private organizations specialized in ICT
- innovation infrastructure
- ministries and agencies, policy makers in ICT.

Conference agenda will include

- Introduction of the **HORIZON 2020, the big**gest EU Research and Innovation programme ever with nearly €80 billion of funding available over 7 years (2014 to 2020). HORIZON 2020 is one of the most open R&D programmes in the world, and organisations from most Eastern Europe and Central Asia countries are eligible for funding from HORIZON 2020.

The *European Commission representative* will make a presentation about the new European Framework programme Horizon 2020, and the ICT components and its priorities

- PICTURE project results
- Success stories coming from the project activities
- Recommendations for future cooperation between the ETPs and the EECA region
- New Support Opportunities for EECA in H2020.

Besides of the PICTURE Project team and experts the following stakeholders will attend the final event:

- ICT stakeholders from the EU and Eastern Europe and Central Asian countries (R&D specialists from universities, research centres, companies, representatives of ICT associations) interested in participation in projects of the upcoming HORIZON 2020;

- Lead scientists, experienced in the preparation, submission and implementation of FP7 ICT projects;

- Policy makers in charge of policy setting and development of ICT sector.

http://www.eeca-ict.eu/news/Final_PICTURE_dissemination_event

http://www.scienceportal.org.by/news/ee3516c0bf68d3ec.html

Success examples of PICTURE

Within the PICTURE project the countries involved the Eastern Europe and Central Asia region (EECA region) were divided into three sub regions based on common ICT R&D features:

- European Partnership (EaP) countries consisting of: Ukraine, Belarus, Moldova, Georgia, Armenia and Azerbaijan;

- Central Asia (CA) countries consisting of: Kazakhstan, Turkmenistan, Uzbekistan, Tajikistan and Kyrgyzstan;

- Russian Federation.

In each of above sub regions the PICTURE project implementation provokes a positive impact to the fostering ICT policy dialog reinforcement and development.

UKRAINE: PICTURE and new trends of developing the dialogue between Ukraine and the EU in ICT

The PICTURE project has become an important part of the process of EU-Ukraine cooperation in ICT. In the preparation and discussion of analytical materials of the project the main key Ukrainian ICT-stakeholders and renowned experts have been involved.

The information about the PICTURE project and the recommendations to the development of dialogue between Ukraine and the EU in ICT is included in the annual report on state of informatization and development of information society in Ukraine for 2012 and 2013. Such reports in accordance with the Law of Ukraine «On the National Informatization Pro-

gram» have to be submitted each year by the Cabinet of Ministers of Ukraine to the Verkhovna Rada of Ukraine (Ukrainian Parliament).

The PICTURE project materials were disseminated to the participants of the second meeting of the EU-Ukraine Joint S&T Cooperation Committee (JSTCC) that took place in Kyiv on 24th of May 2013 at the State Agency on Science, Innovation and Informatization (SASII). ICT is one of the four priority areas of bilateral cooperation between Ukraine-EU in S&T area (NMP, Biotechnologies, ICT and Aeronautics)

Certain proposals of Agency of European Innovations (AEI) on the development of international cooperation and policy dialog in ICT are included in the Strategy of Information Society Development in Ukraine, approved by the Cabinet of Ministers of Ukraine № 386-r dated 15.05.2013. The AEI provided these proposals on the basis of the PICTURE project materials.

The active discussions of the possible reforms in research and innovation sector, the trends of development of information society, and the enhance of cooperation with the EU in R&D&I have occurred during 2011-2013 in Ukraine.

These issues become even more important after the latest changes in the Ukrainian government in early 2014. Currently, the new Ukrainian government creates a country development plan under conditions of limited financial resources. The project of the plan involves the development of cooperation with the EU in all areas. A political part of the Association Agreement with the EU that has been signed on 21st of March provides new opportunities for the development of cooperation between Ukraine and EU, including ICT.

We can note the impact of PICTURE project on the activities of government, business associations and leading ICT organizations and individual scientists and entrepreneurs in Ukraine. The project materials will be used in the preparation of the Parliamentary Hearings on topic "Legislative support of the information society development in Ukraine" to submit proposals for the development of cooperation with the EU in ICT.

KAZAKHSTAN: Development of the Targeted Technological Programs mechanism

The "National Agency for technological development" JSC (NATD) represented Kazakhstan in the PICTURE Project and was involved in the activities planned within the Working Groups 2 & 3 focused on "**Components, Computing Systems and Networks**" and "**Content Technologies and Information management**". Currently JSC "National Agency for technological development" is working on development of the Targeted Technological Programs (TTP) mechanism.

In this regard NATD is reviewing the opportunity to include a new type of grant "on implementation of TTP" into the list of grants, formalized in the Law of the Republic of Kazakhstan "On state support of industrial-innovative activity". Practical work showed that private investors are more interested in a simple reporting scheme and funding not related to the fiscal year. Business needs a clear, flexible, transparent funding system limited in time starting from the moment of submission of application till the moment of reimbursement of costs incurred.

Today 9 types of grants are formalized by the noted Law of the Republic of Kazakhstan. These grants have financial limits (30-150 million tenge), and this amount of money is not enough to implement TTP that should result in new technologies, ready for implementation on the enterprises.

During 2013 NATD has been reviewing experience of Japan, Finland, Switzerland, Norway and Australia in the field of creating analogous programs. The PICTURE project helped NATD to understand the functioning of the European Technology Platforms.

The main goal of Kazakh TTP is to create own breaking technologies through:

- Technology transfer and adaptation of leading foreign developments, or
- Development of technologies, originally prepared by local scientists.

Period of implementing the TTP will be 3 years. The executor of the TTP should be a consortium of two and more organizations, and one of them should represent the science, and the other one – the business. Participants of the consortium should take at least 50% of the costs, related to implementation of the TTP.

Expected results of the TTP:

- Pilot production, ready to industrial level;
- Pilot implementation with operational indicators in real working conditions;
- Technology patent line, ready for licensing.

In this regard, NATD is currently working on introducing amendments in to the noted above Law and preparing rules of awarding the innovation grant on implementation of TTP in the following fields:

1. Development of windpower equipment (small and medium);
2. Development of thermal elements for thermal power plants and solar photoelements;
3. Technologies on production of new generation accumulators (in the field of alternative energy).

TAJIKISTAN: Establishing of new ICT priorities and new ICT NCP

During the PICTURE Project implementation in Tajikistan, the Society for Development of Scientific Cooperation (SODESCO) in closed cooperation with Tajik Technical University identified the new interdisciplinary priorities with application to ICT in addition to those established within the project, which are the following:

1. Water use and rational irrigation issues
2. Diseases prevention and soil erosion
3. Greening of deserts and hills
4. Monitoring of icy surfaces
5. Development of helium energetic
6. Development of early notification system on disasters (mudflow, earthquakes, flooding, dryings, locust invasions, big dusty winds).

ICT priorities developed during the PICTURE Project implementation were discussed with former President of Tajikistan Academy of Sciences – Academician Mamadsho Ilolov. Besides, the importance of establishment of new NCP covering ICT issued was raised during bilateral meet-

ings. In result of those negotiations and meetings, it was possible to establish a new NCP in Tajikistan titled: Centre for innovation development of science and new technologies under Academy of Sciences of the Republic of Tajikistan (further called "Centre") which currently covers ICT issues in Tajikistan. This center started to operate from 1 January 2014. Currently, Academician Mamadsho Ilolov is the Head of this Centre. The Center's activity is focused on the organization and implementation of scientific research, supporting the promising technologies and innovation projects that have considerable impact on national economy development. Besides, the Center can offer informational, analytical, engineering, consulting, data transfer and software installation services.

SODESCO which is National Information Point for EU Framework Programs in Tajikistan believes that this new NCP will contribute a lot to strengthening of ICT sector in Tajikistan and will enhance Tajik scientists' involvement to European community. The privileges of this new NCP on ICT issues are that it is established under Tajikistan Academy of Sciences and has a sustainable budget for its activity provided by the Government. This sustainability will contribute to active operation of this new NCP and cooperation of Tajikistan ICT organizations and specialists with EC framework programs (including new H2020) will be more effective and fruitful.

SODESCO rendered assistance for this center to become a contributor to new EECA-2-Horizon and EAST Horizon Projects which started in 2014. Through that participation SODESCO together with this Center conducted info days for Tajik scientists including ICT specialists for applying to Horizon 2020 projects. Participants were familiarized with Horizon 2020 basic competition requirements, rules for participation, financial aspects and Programs priorities as well as on partner search and how to write a successful proposal. Among other participants main coordinator for EU Framework Programs from Kazakhstan – Ms. Kamila Magzieva and Head, Department of science policy, Ministry of Human Resources – Ms. Bella Cordon were invited for this event to share their best experience and projects in framework programs.

SODESCO is invited to participate in new project titled: "Green+20 - Supporting the development and implementation of an innovative Green Economy Agenda 2020" and hopes that EU will approve this project.

SODESCO in cooperation with new established NCP in Tajikistan on ICT issues will continue actively involve Tajik scientists to European projects.

RUSSIA: Taking new PICTURE in cooperation between Russian Technology Platforms and European Technology Platforms

During PICTURE project, a lot of work was done to systematize the information about the situation in ICT sector in Russia, its priorities and future strategy. The information in the deliverables is represented in a very convenient way and may be used by everyone from the scientists to the ministers.

The Report about EECA ICT priorities has already been used in the preparations for the meetings of the EU-Russia Working Group (WG) on e-Infrastructures and WG on ICT Research. Combined with the outcomes of the PICTURE project Working Groups, especially the Priorities Maps and the Recommendations for Potential Cooperation between ETPs – the European Technlogy Platforms - and Relevant EECA Structures, it will help in making a more constructive EU-Russia dialogue.

Another important outcome is the strengthening of the cooperation between ETP Photonics21 and the Russian Technology Platform (RTP) on Photonics and the starting of the contacts establishment with the other ETPs (Net!Works, NEM, NESSI and, hoping, ETP4HPC during the Workshop in Minsk). During the Workshop in Yerevan ETP and RTP on Photonics have agreed to continue their cooperative dialogue and collaboration and already have arranged the meetings during upcoming events.

As a result 13 experts from Russia participated in the recent Annual Meeting of Photonics21 (27 - 28 March 2014 – Brussels). In fact, St. Petersburg National Research University of Information Technologies, Mechanics and Optics (ITMO University) was one of the sponsors of the aforementioned Annual Meeting of Photonics21 and the Rector of ITMO University was one of the speakers of the event.

Information and communication technologies open calls in HORIZON 2020

HORIZON 2020 is the new EU funding programme for research and innovation running from 2014 to 2020 with around €80 billion budget.

The first calls for proposals for 2014-2015 within Horizon 2020 were published on **11 December 2013**. For ICT domain were announced 2 calls with a total amount of 783 500 000 EUR.

Information and Communication Technologies underpin innovation and competitiveness across private and public sectors and enable scientific progress in all disciplines. Thus in H2020, ICT-related topics can be found in all priorities, from 'Excellence Science' to 'Industrial Leadership' and 'Societal Challenges'.

'Excellent science' research will cover the radically new technological possibilities through the 'Future and Emerging Tech-

nologies', including FET Flagships, and the 'European research infrastructures' ('eInfrastructures').

Research and innovation activities on generic ICT technologies either driven by industrial roadmaps or through a bottom up approach are addressed in the 'Industrial Leadership' pillar, more specifically in the 'Leadership in enabling and industrial technologies' (LEIT) part of the work programme, under the section 'Information and communication technologies.

In addition, the Work Programme features several cross-cutting topics addressing cyber-security, Internet of Things and research on a Human-centric Digital Age. All activities are complemented with support to innovation and take-up, international cooperation and a dedicated action for SMEs to propose bottom-

up innovative ideas, using the SME instrument

In particular, the topics addressed in the first two years of the programme cover the ICT technology value chain in a comprehensive way, from key enabling technologies up to content and information management technologies, robotics and networking technologies. Several cross-cutting topics addressing cyber-security, Internet of Things and research on Human-centric Digital Age are included.

In addition, three ICT-related topics are integrated in the Factory of the Future (FoF) PPP.

Multi-disciplinary, application-driven research and innovation actions leveraging ICT to tackle societal challenges are included in the different 'Societal Challenges' parts of the programme.

HORIZON 2020 ICT and Interdisciplinary Open Calls 2014-2015

Call title	Main Pillar	Publication date	Deadline	Budget (Euro)
H2020-FETFLAG-2014 FET FLAGSHIPS - TACKLING GRAND INTERDISCIPLINARY SCIENCE AND TECHNOLOGY CHALLENGES	Excellent Science	11.12.2013	2014-06-10	1,600,000
H2020-BES-2014 Cyber Security	Societal Challenges	11.12.2013	2014-08-28	40,780,000
H2020-FETOPEN-2014-2015-2 FET-OPEN - NOVEL IDEAS FOR RADICALLY NEW TECHNOLOGIES	Excellent Science	11.12.2013	2014-09-30	3,000,000

Call title	Main Pillar	Publication date	Deadline	Budget (Euro)
H2020-ICT-2014-2	Industrial Leadership	11.12.2013	2014-11-25	125,000,000
H2020-FETHPC-2014 FET-PROACTIVE - TOWARDS EXASCALE HIGH PERFORMANCE COMPUTING	Excellent Science	11.12.2013	2014-11-25	97,400,000
H2020-SCC-2015 SMART CITIES AND COMMUNITIES	Societal Challenges	11.12.2013	2015-03-03	108,180,000
H2020-MG-2015_TwoStages MOBILITY FOR GROWTH 2014-2015	Societal Challenges	11.12.2013	2015-03-31 2015-08-27	185,200,000
H2020-DS-2015-1	Societal Challenges	11.12.2013	2015-04-21	49,610,000
H2020-FETOPEN-2014-2015-1 FET-OPEN - NOVEL IDEAS FOR RADICALLY NEW TECHNOLOGIES	Excellent Science	11.12.2013	2015-09-29	154,000,000
H2020-FETOPEN-2014-2015-3 FET-OPEN - NOVEL IDEAS FOR RADICALLY NEW TECHNOLOGIES	Excellent Science	11.12.2013	2015-09-29	3,000,000

TWO NEW PROJECTS STARTED, to support EU-EECA ICT collaboration

Two new FP7 projects started on February 1, 2014 with the duration of 30 Months: EECA-2 HORIZON and EAST-HORIZON. Working in synergies, they will assure the continuation and sustainability of activities performed within the PICTURE and previous ICT EECA Cluster projects, and the support to EU-EECA collaboration.

EECA-2-HORIZON: "Bringing the EU-EECA Cooperation and Policy Dialog in ICT in the HORIZON 2020"

The man aim of the EECA-2-HORIZON project is to **reinforce the development of strategic and mutually beneficial partnerships in ICT**

between the EU and the East Europe and Central Asia (EECA) countries. The overall goal is to strengthen the links and boost cooperation among the research and industrial communities of both regions to exploit emerging opportunities for international partnerships (both under EU and EECA RTD&I programmes) and jointly address common societal challenges. EECA Countries involved: Russia, Ukraine, Belarus, Georgia, Armenia, Azerbaijan, Moldova and Kazakhstan.

To achieve this overall aim, the EECA-2-HORIZON project has set the following objectives:

1. **Create a knowledge sharing and collaboration environment for ICT research and industrial actors from both regions.** An "*EU-EECA Virtual Collaboration Breeding Environment in ICT*" ("*ICT Platform*") will be developed to inform, facilitate interaction and support collaboration towards the formation of strategic partnerships under both EU and EECA RTD&I programmes.

2. **Link and bring together leading ICT research and industrial actors from both regions** in areas of mutual interest and added value for EU and EECA cooperation, foster their interaction and eventually boost the formation of strategic international partnerships. This will be based on 2 pillars:

   - **RTD&I actors:** a number of sustainable cooperative "*ICT Communities*" will be created having a thematic focus (e.g. focusing on specific ICT sub-areas) to maximise the efficiency of interactions.

   - **Technology Platforms:** the aim is to strengthen the interaction and cooperation among European Technology Platforms and similar structures and interested stakeholders from the EECA countries.

3. **Reciprocity in collaboration by promoting and supporting the participation of EU researchers in EECA programmes.** The aim is to identify and analyse RTD&I programmes and initiatives from the EECA countries that are open to the participation of EU research teams and/or individual researchers, with a view to highlight and promote emerging opportunities for EU actors, and eventually

support the international cooperation under EECA programmes

4. **Support dialogue between the EU and the EECA countries on enhancing their cooperation in ICT** by communicating the project findings to ICT stakeholders from both regions as well as to the EC. The goal is to contribute to the formation of the HORIZON 2020 research orientation, with regard to reinforce the participation of the EECA ICT research and industrial actors in HORIZON 2020.

5. **Organise a series of increase awareness and networking/twinning events in both regions** to promote and facilitate collaboration among ICT actors.

EECA-2-HORIZON **builds upon the invaluable legacy in EU-EECA cooperation in ICT that was created by the PICTURE project** (FP7-ICT CSA, ongoing) **and its preceding EECA-ICT cluster** that was formed by joining forces of FP7-ICT CSAs, namely: **ISTOK-SOYUZ**, **SCUBE-ICT** and **EXTEND** (completed in 2011).

Overall, to avoid duplication of work, maximize synergies and impact, successfully utilize PICTURE project outcomes as well as address issues of particular interest for the EC, EECA-2-HORIZON consortium will closely collaborate, coordinate and adjust its activities with the EAST-HORIZON project activities. Both projects started on February 2014, focus on the same region and have similar objectives.

EAST-HORIZON: "Fostering Dialogue and Cooperation between the EU and EECA in the HORIZON 2020 perspective"

http://www.eeca-ict.eu/about/the-eeca-cluster/east-horizon

EAST-HORIZON aims to assist ICT R&D policy dialogue between Eastern Europe and Central Asia (EECA) partner countries and the European Commission, paving the path for EU-EECA successful strategic partnerships. EECA countries involved in the project are: Russia, Arme-

nia, Azerbaijan, Belarus, Moldova, Ukraine, Georgia, Kazakhstan, Uzbekistan and Kyrgyzstan, EU and Associated countries are: Greece, Italy and Israel.

EAST-HORIZON will inspire ideas and influence policies to help the Dialogue between the EU and the EECA, which will lead to the best possible benefits for both sides and in parallel will support organisations from both sides to prepare successful proposals for joint projects in collaborative ICT R&D, within the Horizon 2020 and in national EU/EECA ICT R&D programmes.

The specific objectives of the EAST-HORIZON project are to:

1. **Support the Dialogue between EU and EECA countries at all levels.** To this end, EAST-HORIZON will mobilize the most influential and knowledgeable people and Institutions and will provide the necessary tools for an efficient continuous collaboration.

2. **Raise awareness among EECA organizations about H2020** through focused events which will provide a deep insight into H2020 challenges and priorities, Information Society (IS) Policy Co-operation activities, and how this fits into the Digital Agenda for Europe.

3. **Adopt a holistic approach towards ICT R&D.** This will bring together ICT research institutions, Information Technology Industrial companies and key ICT Users in each country, to maximize impact in ICT research collaboration and foster the wider and more holistic promotion of innovation. It will link tri-partite (Research, Industry, Users) focus Groups with ICT R&D policy makers to influence policies and to shape or strengthen business links between the EU and the EECA countries Information Technology Communities.

4. **Create permanent structures and mechanisms, sustainable after the end of the project.** EAST-HORIZON will establish a permanent communication and collaboration platform, an environment where all ICT Research players can meet and work together to raise ideas for joint Research projects. The platform, linked to similar platforms, will be transferred to EECA stakeholders at the end of the project, for achieving sustainability of collaboration mechanisms built under EAST-HORIZON.

EAST-HORIZON first main target is the validation and update of the Strategic Research and Innovation priorities of the EECA Region adapted to the HORIZON 2020 new concept.

EAST-HORIZON will take stock and build on the work done in previous relevant support actions in the same wider geographical area.

In particular EAST-HORIZON will consider and work on PICTURE Project recommendations and strategies for reinforcement of bilateral and multilateral cooperation, covering the large geographical area of the EECA.

The communication and collaboration platform will be jointly deployed by EAST-HORIZON and EECA-2-HORIZON projects and will be available by end of July 2014. The platform will provide more information on the projects' activities as well as support to the EECA researchers.

EECA-2 HORIZON and EAST-HORIZON projects will continue to provide support to the EU and EECA ICT community after the end of the PICTURE project.
Stay updated: www.eeca-ict.eu

List of consortium partners per country:

Country	Organisation	Contact Name	E-mail	Tel. & Mobile phone	Skype
France	inno	Svetlana Klessova (coordinator) Camille Vidaud	s.klessova@inno-group.com c.vidaud@inno-group.com	+334 92 38 84 26 +334 92 38 84 17	
Greece	Q-PLAN	Kostas Bougiouklis Petros Papadionissiou	bougiouklis@qplan.gr papadionisiou@qplan.gr	+30 2310411191 +30 6978897827 +30 6978897401	
Armenia	IIAP	Levon Aslanyan Hasmik Sahakyan	lasl@sci.am hasmik@ipia.sci.am	+374 94 521 913 +374 55 511231	laslanyan
Azerbaijan	RITA	Tofig Babayev	tbabayev@bk.ru	+994 50 21 259 13 +994 50 31392 02 +994 1 2 53 913 68	babayev.tofiq
Belarus	BELISA	Tatyana Lyadnova	tlyadnova@fp7-nip.org.by tlyadnova@belisa.org.by novat2@gmail.com	+375 29 335 98 68 +375 17 203 10 16	
Georgia	GRENA	Givi Kochoradze Ramaz Kvatadze	gcp@ip.osgf.ge givi.kochoradze@yahoo.com ramaz@grena.ge	+995 599 29251 (Givi) +995 599 562869 (Ramaz)	ramaz.kvatadze
Kazakhstan	NATD JSC	Timur Shalabayev	timur.shalabayev@nif.kz	+7 7172 517024 (add 247)	
Kyrgyzstan	EIMO	Kunduz Rysbek	abilayabilay@gmail.com	+99 6 543 714 741	azumi2348
Moldova	CIP	Lidia Romanduc Igor Cojocaru	intprojects@asm.md mrda@mrda.md cojocaru@asm.md	+ 373 22 270 774 (Lidia) + 373 7 9 45 4 575 + 373 22 7 3 33 01 (Igor)	
Russia	E-ARENA	Marat Biktimirov	marat@e-arena.ru marat@ras.ru	+749 913 525 98	
Tajikistan	SODESCO	Ilkhom Mirsaidov Mirzo Akramov Shabnam Tosheva	i.mirsaidov@nrsa.tj agentilhom@mail.ru mirzo_1@mail.ru shahiya@mail.ru	+99 2 918 244 944 +992 918 237 777 +992 378 814 906	
Turkmenistan	SCC Altyn Umyt	Charyyar Amansahedov Rustam Gadzhiyev	amansakhatov@yandex.ru rustamtme@gmail.com	+993 65 5 60 720	
Ukraine	AEI	Ivan Kulchytskyy	kul.ivan@gmail.com	+ 380 999 064 447	
Uzbekistan	IMNUU	Prof. Fatima Adilova	fatima_adilova@rambler.ru	+ 998 712 629 878	