

**“Evaluation of STI policies, instruments and organisations: New horizons – new challenges”
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S&T Policy Mix Peer Review for Kazakhstan
A case study

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Outline

- **Introducing Kazakhstan**
- **The S&T Peer Review exercise**
- **The RTDI policy system of Kazakhstan**
- **Reviewing the peer review exercise**
- **Summary**

ANNEXES:

- **Some results**
 - Funding of RTDI
 - Universities, research institutes, NAS
 - The business sector and RTDI, Science-business cooperation
 - Human resources for RTDI
 - International cooperation

Introducing Kazakhstan

Some general information



- **Area:** 2,724,900 km² (rank: 9)
- **Population:** 16.80 million (5,94/km²)
- **Currency:** Tenge
- **Capital:** Astana (since 1997)
- **Government:** Presidential Republic
- **President:** Nursultan Nasarbayev
- **Legislature:** Parliament
- **Industry:** Oil, bauxite, chromite, coal, copper, gold, iron ore, lead, manganese, phosphates, silver, sulfur, titanium, uranium, zinc; iron and steel, agricultural machinery, electric motors, construction materials
- **Time zone:** UTC + 6h

Introducing Kazakhstan

Some impressions



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Introducing Kazakhstan

Some indicators

- **Economic indicators**
 - GDP \$200.8 bn, economic growth 9,7%, GDP per capita \$9,750, **R&D expenditures 0,3% of GDP**
- **WEF Global Competitiveness Index (GCI) 2011-2012**
 - GCI Rank 72 (out of 142); 2010-2011: Rank 72
- **Ease of Doing Business 2014 (DB2014) Ranks out of 183:**
 - DB2014: 50, DB2013: 53, DB2012: 47, DB2011: 58
- **Ernst & Young's 2012 attractiveness survey of Kazakhstan**
 - 43% of respondents see Kazakhstan's investment climate improving
 - **only 15% of respondents find R&D availability and quality attractive**
- **Kazakh universities in international rankings**
 - **In 2011 QS World University Rankings, Al-Farabi Kazakh National University and LN Gumilev Eurasian National University are in the 400-450 group**

The S&T Peer Review exercise

IncoNet EECA and the Peer Review: Objectives

- **Objectives of FP7 IncoNet EECA:**
 - Supporting the S&T dialogue between the European Union and Kazakhstan
 - Involving stakeholders from government, science, and industry
 - Increasing Kazakh participation in FP7
 - Preparing analyses feeding the S&T policy dialogue
- **Minister Asset Issekeshov (MINT) invited IncoNet EECA to perform S&T Peer Review for Kazakhstan**
- **Rationale of S&T Policy Mix Peer Review**
 - Examination & review of KZ RTDI system – mutual learning
 - Improving design and implementation of RTDI policy

The S&T Peer Review exercise

Definition, topic, objectives

- Peer review can be described as the systematic examination and assessment of the performance of a State by other States, with the ultimate goal of helping the reviewed State improve its policy making, adopt best practices and comply with established standards and principles (OECD, 2003)
- The topic of the review is improving the design and implementation of national S&T policy mixes
- The objective is to contribute to a better understanding of the processes and mechanisms involved in the setting and implementation of national S&T policy mixes conducive to increased investment in S&T and innovation performance

The S&T Peer Review exercise

The IncoNet EECA Peer Review Team

- **Prof. Manfred Horvat (Team leader)**
 - S&T Policy Analyst, TU Wien; former Director European and International Programmes, Austrian Research Promotion Agency (FFG), Austria
- **Prof. Jean-Luc Clement**
 - Adviser on research affairs, Ministry of Higher Education and Research, France
- **Margit Harjung**
 - Deputy Head of Unit for R&T Funding, Federal Ministry of Transport, Innovation and Technology, Austria
- **Michael Schlicht,**
 - Head of Department for Cooperation with Russia and CIS, Federal Ministry of Education and Research, Germany
- **Vardan Sahakyan**
 - Head of Science Policy Department, State Committee of Science of the Republic of Armenia
- **Zygmunt Krasiński**
 - Deputy Director of National Contact Point for EU Research Programmes, Poland

The S&T Peer Review exercise

The Kazakhstan support team

National Host:

- **Zhumatay Salimov**
 - Managing director, Director of Analytical and Methodological Center, NATD National Agency for Technological Development, JSC

Senior Country Correspondent:

- **Kamila Magzieva**
 - Director InExCB-Kz, National Coordinator FP7 NCP for Kazakhstan

The S&T Peer Review exercise

INCO-NET EECA Steering Committee

- **George Bonas (ICBSS, GR)**
 - INCO-NET project coordinator, quality assurance
- **Klaus Schuch (ZSI, AT)**
 - INCO-NET WP9 leader, quality assurance
- **Jörn Sonnenburg and Kirsten Kienzler (IB-DLR, DE)**
 - Quality assurance
- **Gorazd Weiss (ZSI, AT)**
 - Logistical support

The S&T Peer Review exercise

The approach 1

- **Review based on expert assessment and opinion**
- **International Peer Review team supported by**
 - National Kazakhstan correspondents
 - INCO-NET steering committee
- **Kick-off meeting 23-24 January 2012**
- **Background: Country Report by InExCB-KZ**
- **Interviews during missions to Kazakhstan**
 - the whole team: to Astana and Almaty 12-16 March 2012
 - the team leader: 22-24 May 2012 and 27-29 June 2012
- **Short individual reports by team members**

The S&T Peer Review exercise

The approach 2

- **Integration of reports into synthesis mission report**
- **Individual interviews by team leader**
- **Additional desk research**
 - Relevant laws, concepts and plans, President's addresses, supporting documents, RTDI policy literature
- **Draft Report for discussion on 27 June 2012**
 - Feedback from Kazakhstan stakeholders
- **Feedback from the Peer Review team**
- **Final Report by team leader delivered by mid July**
- **Short presentation to President Nazarbayev:
23 Oct 2012**

The S&T Peer Review exercise

Main focus areas of the Peer Review

- **The RTDI Policy System in Kazakhstan**

ANNEX:

- **Funding of RTDI in Kazakhstan**
- **Universities, research institutes, National Academy of Sciences**
- **The business sector and RTDI**
- **Science-business cooperation**
- **Human resources for RTDI**
- **International cooperation**

The S&T Peer Review exercise

The Country Report

Prepared by national correspondent K. Magzieva et al., InExCB-KZ

Contents:

- **Introduction to Kazakhstan economy etc.**
- **The Kazakhstan RTDI system and Policy Mix**
- **Self-assessment – Strengths and Weaknesses**
- **Summary**
- **Conclusions**

Prepared in three steps:

- **First preliminary draft**
- **Substantial comments and requests by PR team**
- **Country Report Final Version (Annex 7 of Report)**

The S&T Peer Review exercise

Missions to Kazakhstan: Guidelines

Main issues and topics for discussions:

- **Evidence in support of and complementary to the Country Report**
- **Position & role in the national innovation system**
- **Main linkages and relationships**
- **Objectives, activities, outputs**
- **Budgets, human resources, infrastructure**
- **Any other issues**

The S&T Peer Review exercise

Missions to Kazakhstan: Interviews

- **Ministry of Industry and New Technologies**
- **Ministry of Education and Science**
- **Ministry of Environment**
- **Ministry of Finance**
- **Economic Research Institute**
- **The EU Embassy**
- **National Agency for Technological Development**
- **National Centre for Scientific and Technical Information**
- **State Statistics Agency**
- **National Academy of Sciences**
- **Nazarbayev University**
- **Al-Farabi KazNat University**

- **Kazak National Technical University Satbayev**
- **Almaty Technical University**
- **Alatau IT City – Almaty Regional Technology Park**
- **Nat. Centre for Complex Processing of Mineral Raw Materials**
- **Centre for Earth Sciences, Metallurgy and Enrichment**
- **Meteorology Centre “Kazgidromet”**
- **Institute of Nuclear Physics**
- **National Wealth Fund “Samruk-Kazyna”**
- **KazTransOil JSC, S&T Centre**

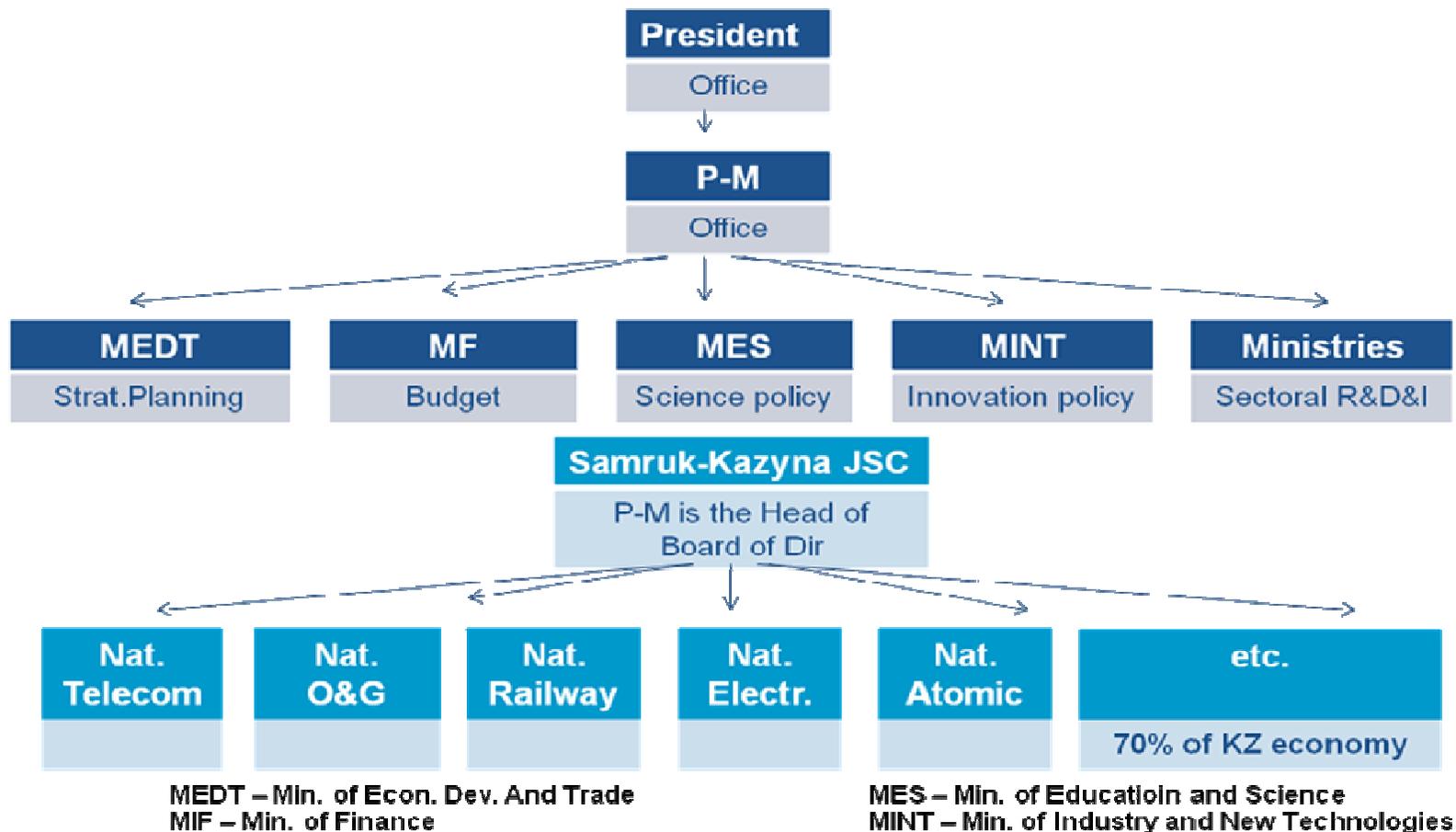
The S&T Peer Review exercise

Missions to Kazakhstan: meetings

- **Two meetings with Kazakhstan FP7 NCPs**
- **Several individual meetings with MINT**
- **Feedback meeting for Draft report, 27 June 2012, feedback from additional organisations:**
 - Ministry of Agriculture
 - Holding KazAgroInnovation
 - Ministry of Economic Development
 - Committee of Medical and Pharmaceutical Activity, Ministry of Health
 - Committee of Science, Ministry of Education and Science
 - Scientific-technological Holding “Parasat”
 - National Centre for Nuclear Research, Astana Branch

The RTDI Policy System of Kazakhstan 1

Governance structure: Macro level



Source: Zhumatay Salimov; Kick-off meeting, 24/01/2012, Country Report, InExCB-KZ, 2012, p. 7

The RTDI Policy System of Kazakhstan 2

Governance structure: Micro level

Science	Innovation and Technological Development
<p>Law on Science, February 2011 Higher S&T Council, headed by Prime Minister Ministry of Education and Science Science Fund, JSC</p>	<p>Law on State Support of Industrial Innovation Activities, January 2012 Council on Technological Development, headed by Prime Minister Ministry of Industry and New Technologies National Agency for Techn. Development, JSC</p>
<p>5 national scientific laboratories for shared use 15 laboratories of engineer profile 41 research entities 132 national universities in Kazakhstan (22 are involved in S&T)</p>	<p>7 Technoparks 3 Design Bureaus 1 Free Economic Zone, Alatau IT City 2 International Technology Transfer Centers 8 Commercialization Offices</p>
<ul style="list-style-type: none"> - Grants for basic research and industry targeted activity - Approval of all Ministries research programs and budgets 	<ul style="list-style-type: none"> - 9 types of innovation grants - Technological business incubation services - Commercialization services - Project and Venture Financing (Equity) - Technology Programmes (based on foresight)

Source: Zhumatay Salimov; Kick-off meeting, 24/01/2012

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The RTDI Policy System of Kazakhstan 3

General policy framework

- **Policy initiatives set by the President in annual State of the Nation addresses, e.g.**
 - Strategy Kazakhstan 2030 as long-term policy framework
 - 2012: “Socio-Economic Modernization as the Main Vector”
 - Development of the National Innovation System
 - Strategic plans & highly ambitious goals (2015-'20-'30: 1-2-3%)
 - Lead projects: Nazarbayev University, Alatau IT City
 - Socio-economic initiatives, priority infrastructures
 - Initiatives: “Green economy” and “Green bridge”

The RTDI Policy System of Kazakhstan 4

Important developments in recent years

- **Many developments are very recent ...**
- **Legal framework and institutional structures for higher education and RTDI**
- **Foresight exercise organised by NATD (NIF)**
 - Concept of Innovation Development
 - Targeted Technology Programmes
- **Knowledge transfer & innovation infrastructure**
- **Plan for higher education**
- **Funding programmes for basic science**
- **RTDI initiatives of Samruk-Kazyna and sub-soil sector**

The RTDI Policy System of Kazakhstan 5

Main comments

- **Ambitious goals call for feasibility assessment and mid- and long-term roadmaps for implementation**
- **Important elements of the NIS are established – strengthening linkages and cooperation must follow**
- **Ensure ownership of policies by main actors**
- **RTDI plans have to consider the adoption potential of the NIS – human resource development**
- **Innovation needs “humus” of basic research**
- **Evidence based policy making calls for a robust basis of RTDI data and indicators**

The RTDI Policy System of Kazakhstan 6

Main recommendations

Important elements of the NIS are established – next steps

- Closer coordination and cooperation between MINT & MES, and between TCP & HSTC, as well as between NATD & Science Council
- Strengthen the research universities parallel to Nazarbayev Universities
- Put priority on human resources development for research
- Evaluate structure and performance of research institutes and prepare development plan for that sector
- Train managers of innovation infrastructures to become change agents
- Develop conducive business environment and facilitate setting up of new innovative companies around universities and in technology parks
- Stimulate business interest and demand for RTDI by intensifying science-business interaction, cooperation and partnership
- Encourage entrepreneurship and offer appropriate training & coaching
- Use Presidential initiatives and infrastructure projects for linkages with RTDI, e.g. pre-commercial procurement, public procurement, strategic programmes “Societal challenges”, etc.
- **Develop an “evaluation culture” and a robust RTDI data basis**

Reviewing the Peer Review exercise 1

Supporting and limiting factors

- **The main actors of the exercise and their roles and functions**
 - **Peer Review team**
 - A mix of EU15, EU12 RTDI policy experts including regional insight
 - **Senior Country Correspondent and her team in Kazakhstan**
 - Link to Kazakhstan RTDI policy system
 - **National host (NATD)**
 - General support, closely linked to the main sponsor of the review (MINT)
 - **Ministry for Industry and New Technologies (MINT)**
 - Invited the INCO-NET project to perform the exercise
 - **National RTDI stakeholders**
 - Ministries, agencies, universities, research institutes, state companies
 - **INCO-Net Steering Committee**
 - Setting the stage, providing guidance, examples and benchmarks

Reviewing the Peer Review exercise 2

Supporting and limiting factors

Some aspects to consider:

- **Senior Country Correspondent**
 - Country report, back ground information, “self-assessment”
 - Main “gate-opener” and “gate-keeper” to the Kazakhstan NIS
- **National host**
 - Providing detailed feedback to draft report
- **Collective expertise of the PR team - Interactive expert based review**
- **Ensure ownership of the exercise by the major national stakeholder(s)**
- **Develop realistic catalogue of issues to be addressed**
- **Work hard to obtain reliable data and identify evidence, validity, credibility**
- **Get the balance right between quantitative and qualitative information**
- **Ensure multiple feedback – PR team, target country stakeholders**
- **Time: available resources and limitations for scheduling**
 - Time resources of experts for preparation, for one week mission and for providing feedback
 - Fine-tuning and balancing the agenda:
Preparatory phase – missions – drafting & finalising the report
- **Making the right estimates of the needed effort**
- **It’s a learning exercise providing feedback, its not an evaluation**

**For some detailed results
see the ANNEXES!**

Thank you for your attention!

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Annex: Some detailed results

The S&T Peer Review exercise

Main focus areas of the Peer Review

- **Funding of RTDI in Kazakhstan**
- **Universities, research institutes, National Academy of Sciences**
- **The business sector and RTDI**
- **Science-business cooperation**
- **Human resources for RTDI**
- **International cooperation**

Funding of RTDI in Kazakhstan

Comments and recommendations

- **0,16% - 1,00% - 2,00% - 3,00% goals must be based on long-term political support and sustainable financial commitment**
- **Foster closer coordination and cooperation between MES and MINT and sectoral ministries**
- **Establish a joint body of the boards of the two councils or consider merger of the two councils to a “Council of RTDI”**
- **Ensure communication between NATD and Science Fund**
- **Align priorities and programmes between MES, MINT and “Samruk-Kazyna” as well as the sub-soil sector and strengthen synergies and mutual enforcement**
- **Strengthen competitive funding - project evaluation, selection, monitoring and review**
- **Develop systems of programme review, monitoring, evaluation and impact assessment at all levels – “evaluation culture”**
- **Present an annual report on RTDI in Kazakhstan**

Universities, research institutes, NAS 1

Comments and recommendations

- **Universities:**
 - Very good impressions from visits to four universities
- **General recommendations regarding universities**
 - Evaluate appropriateness of number of universities – UniPlan 2020
 - Follow a two-pronged approach developing Nazarbayev University (NU) and fostering excellence of existing universities at the same time, learn from others
 - Give universities more autonomy, strengthen institutional management
 - Base funding for all missions of universities on performance contracts
 - Strengthen third mission of the universities towards the “real world” and encourage changes of attitudes and mindsets of academics
 - Put a priority on the development of human resources for RTDI, attract students to science and engineering, and reward excellence in education, research and innovation (cooperation with industry etc.)
 - Develop institutional strategies towards professionalisation of research management, entrepreneurship, commercialisation and innovation, international cooperation, etc.
 - Improve research infrastructure towards international standards
 - Explore potential for cooperation or mergers with research institutes
 - Combine regional impact and local-global connectiveness
 - Raise attractiveness and public image of academic careers

Universities, research institutes, NAS 2

Comments and recommendations

- **Research institutes**
 - Very good to mixed impressions from visits to selected institutes
- **Recommendations regarding research institutes**
 - Provide an overview of capacities and capabilities of research institutes
 - Launch an evaluation of the research institutes, prepare a development plan for that sector in line with national plans and priorities
 - Strengthen coordination and cooperation of institutes in national priority areas
 - Explore potential of integration of research institutes in universities (beyond present state), learn from recent European experiences
 - Strengthen national and regional impact and international cooperation beyond neighbouring countries
 - Promote integration in international RTDI communities
- **National Academy of Sciences**
 - Define future role of NAS beyond coordination of annual report

The business sector and RTDI

Main comments and recommendations

- **Lack of demand for RTDI of business sector as major limiting factor for modernisation efforts towards knowledge based society**
 - Ensure participation of business sector in policy development process – develop “ownership”, motivation, interest, mutual awareness
 - Foster business-business RTDI cooperation in major infrastructure projects initiated by the president
 - Promote involvement of SMEs in RTDI initiatives of “Samruk-Kazyna” and calls for proposals launched in that context
- **Further improve the favourable environment for business creation and investment with special regard to innovative SMEs**
- **Join forces for encouraging and supporting start-ups**
- **Provide stimulation & training for entrepreneurship as well as management of innovation and intellectual property (IP)**

Science-business cooperation 1

Main comments and recommendations

General:

- **There is still a big gap between science and business**
- **Address the challenges of changing mind-sets and attitudes**
- **Consider Triple-Helix of university-industry-government relations in combination with the Knowledge Triangle of integrating education-research-innovation**
- **Develop a diversified strategy of university-industry communication, cooperation and partnership**
- **Focus on co-creation or co-development approaches**
- **The universities have to develop active measures for stimulating communication with industry**
- **Providing rewards for collaborative universities**

Science-business cooperation 2

Main comments and recommendations

Innovation infrastructures

- **The universities should develop interfacial structures for supporting cooperation, e.g.:**
 - Corporate outreach office, entrepreneurship & innovation centre, technology transfer office TTO, research support, IPR and legal services, project centre for contract management, open lab – there is a need for top professionals!
 - Public Private partnerships (competence centres, integrated centres of excellence) as a development goal when NIS is further advanced and developed
- **NATD infrastructures such as technology parks, incubators, clusters, commercialisation structures are essential but need professionals with special qualification profiles**
 - Managers have to act as change agents in their regions
 - Establish a network of these organisations as a platform for mutual exchange of experience and joint learning
 - Develop cooperation with partners in Europe and in other parts of the world as a means for learning from good practice but also for raising the visibility of Kazakhstan abroad

Human resources for RTDI

Main comments and recommendations

- **Human resources (HR) for RTDI : need to develop at home and attract from abroad**
- **Make careers in science and research more attractive**
- **Promote intersectoral mobility science-business**
- **Extend the Bolashak International Scholarship Programme also to management positions at universities and research institutes**
- **Raising the attractiveness of Kazakhstan as a location for doing advanced teaching and research**
- **Exploiting the potential of the Kazakhstan S&T diaspora**

International S&T cooperation 1

General comments and recommendations

- **International cooperation as a key element of developing the Kazakhstan NIS**
- **Broaden proficiency of English language!**
- **Foster openness to the world by developing a favourable framework for mobility and cooperation**
- **To be developed in parallel: Nazarbayev University and other top research universities as flagship institutions and attraction points**
- **Make strategic use of bi-lateral agreements for supporting the national RTDI goals and strategies**
- **Strengthen the links to neighbouring countries for forming critical mass for international cooperation**

International S&T cooperation 2

RTDI cooperation with the European Union

- **Kazakhstan is involved in EU research activities since the 1990s: INTAS and later in the EU RTD FP**
- **Horizon 2020: Deepen the cooperation with the EU in areas of mutual interest such as energy, raw materials, environmental protection, space**
- **Kazakhstan National Contact Points (NCPs) are well established and are involving key actors in NIS of Kazakhstan but need to be strengthened and provided with sustainable financial support**