

SESSION II:
**Innovation policy and green
technologies in Kazakhstan**

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Outline

- The economic context for innovation activities
- The national development strategy
- The national innovation system (NIS)
- Strengthening the NIS
- Opportunities for green technologies in Kazakhstan
- The way forward

The economic context for innovation activities

- A stable macroeconomic environment
 - Sustained high economic growth
 - Low inflation
 - Sound government finances
- An improving business investment climate
 - Regulatory reforms
 - Improved rankings in the World Bank's Doing Business Surveys : 2013 : 49 / 185 countries
- But: Limited access of SMEs to finance

The economic context for innovation activities (II)

- Main structural features of the economy
 - Dominance of resource-extracting activities
 - Small manufacturing base
 - Low productivity in manufacturing; agriculture
 - Large state-owned firms play an important role
 - SMEs are largely concentrated in the trade and services sector
 - FDI inflows : mainly in the extractive industries sector

National development strategy

- Priority areas
 - Diversification of economic activities :
 - Stronger role for non-resource extracting sector
 - Transition to a green economy
 - Development of low-carbon economy
- Main mechanism: Development, adaptation and diffusion of innovative technologies
- Need an effective national innovation system
- State Programme for Accelerated Industrial Innovation (SPAIID) 2010-2014 (and many others)

The national innovation system (NIS)

Main institutions involved

- Government (Innovation policy)
- Research institutions, universities (Knowledge generation)
- Business sector (Demand for innovation)
 - Innovative entrepreneurship (“Start-ups”)
 - SMEs
 - Technoparks; Business incubators, etc.
- Support infrastructure (notably financing of innovation projects)

R&D sector in Kazakhstan

- R&D capabilities are located mainly in public organizations rather than enterprises
- Dominance of basic research; weak firm-specific R&D
- Little spending on development (engineering design; technological work; prototyping etc.)
- Overall capabilities of the R&D sector difficult to assess . WEF ranking 108 / 144 - “Quality of research institutions”
- Efforts to strengthen research activities
 - Nazarbayev university
 - Agrotechnical university (planned)

R&D sector in Kazakhstan (II)

- Low R&D expenditures : 0.2% of GDP in 2012
- Government adopted measures to boost R&D expenditures (private and public sector)
- Innovation performance indicators
 - Relatively low number of patents
 - Small proportion of firms engaged in innovative activities (some 6 per cent in 2011)
 - But upward tendency

Business sector

- Overall weak demand for innovations
 - Oil and gas sector relies largely on imported technology (which is available domestically)
 - Demand from other sectors relatively weak, given the absence of significant competitive pressures for large (mainly) state-owned companies
 - Lack of strong presence of small- and medium sized enterprises in industry

Industry-science linkages

- Business innovation activities depend crucially on supply of knowledge from the science sector
- Linkages are underdeveloped
 - Low domestic demand for innovation
 - Barriers for commercialization of inventions
- Government measures to facilitate building of industry-science linkages
 - Technoparks, business incubators; special economic zones; Centers for commercialization of R&D outputs

Technoparks

- Limited knowledge intensity and impact on diffusion of innovation
- Weak or non-existent linkages of firms with research institutions
- Start-ups have insufficient financial resources for technology commercialization
- Lack of expertise and management capabilities

Human resources for R&D and innovation

- Government has increased efforts to strengthen the education and training system
- Major problem: attract young people to science and engineering
- Average age of staff in research sector : 54
- Vocational training system is underdeveloped
- Risk: lack of skilled human resources as a limiting factor for research, innovation and economic diversification!

Strengthening the NIS

- The institutional and legal framework for a modern NIS has been created.
- But there is a large array of policies and measures required to further developing and strengthening the NIS.
- See: UNECE Innovation Performance Report on Kazakhstan

Strengthening the NIS (II)

- Improve framework conditions for innovation
 - Create more competition in domestic markets
 - Foster creation of new SMEs and start-ups
 - Improve access of SMEs to finance
 - Support the development of a domestic venture capital sector
 - Strengthen intellectual property rights
 - Explore role of public-private partnerships in innovation
- Increase financial resources allocated to R&D

Strengthening the NIS (III)

- **Strengthen industry-science linkages**
 - Establish clear rules for the commercialization of inventions made in public research institutes
 - Intellectual property rights at patents
 - Create more supportive conditions for business start-ups for commercialization of inventions and for young SMEs
 - Access to finance at pre-commercialization stage
 - Enhance credit guarantee schemes

Strengthening the NIS (IV)

- **Promote knowledge spillovers**
 - Strengthen cooperation among universities, research institutes and enterprises
 - Consider technology needs of enterprises in setting of research priorities
 - Technology foresight activities;
 - Technology road maps
 - Strengthen cooperation with foreign research institutes and international research networks

Strengthening the NIS (V)

- Foster linkages between foreign investors and domestic SMEs
 - Promote integration of SMEs in global supply chains
 - Channel for transfer of technology; know-how; and tacit knowledge (through personal contact, interaction and trust)
- Linkages between foreign investors and domestic SMES promote economic diversification!

Opportunities for greening of economic growth

- Potentially high demand for green technologies, including for climate change mitigation and adaptation:
 - Environmental problems (air, water and soil pollution; waste management)
 - Low energy and resource efficiency
 - High carbon intensity of GDP
 - Low efficiency in use of water resources (agriculture)
 - Unsustainable land management techniques

Recent government measures

- Laws for the promotion of
 - Renewable energy sources (2009),
 - Development of a nation-wide feed-in tariff system
 - Energy saving and energy efficiency (2012)
 - Power plants, industry, buildings
 - Waste treatment and recycling
 - Implementation is still at an initial stage
- Preparations for a national carbon emissions trading system (ETS) started in 2012
 - Incentives for cleaner green technologies

Other important areas for green technologies

- Water sector
 - Rehabilitation of irrigation and drainage system (very high water losses)
 - Rehabilitation of water supply and sewerage systems
 - Increase re-use of water in industry
 - Install modern water saving and water treatment technologies

Other important areas for green technologies

- **Agriculture**

- Adaptation to climate change variability and long-term climate change impacts
- Development of drought-resistant and less water-intensive crops
- New land management technologies
 - Significant progress was already achieved in the application of “zero-tillage” technology
 - Significant support from local agricultural researchers

The way forward (I)

- Most of the required technologies for modernization, diversification and greening of economic growth already exist in the global markets
- Give priority (at least in the short-run) to building absorptive capacities for the adaptation of technologies to local circumstances.
- Use a mix of environmental policy instruments to create incentives for green technology innovations.
- These incentives are currently lacking!

The way forward (II)

- Foster (green) innovative activities in the process of economic diversification
 - SMEs as a source of supply and demand for innovations
- Integrate innovation policy in sectoral development policies.

THANK YOU!