

# **The National Innovation System of Azerbaijan in the context of the effective development and diffusion of green technologies**

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and Financing of Innovative Green Technologies**

**Ways to Greening the Industry**

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# Structure of the presentation

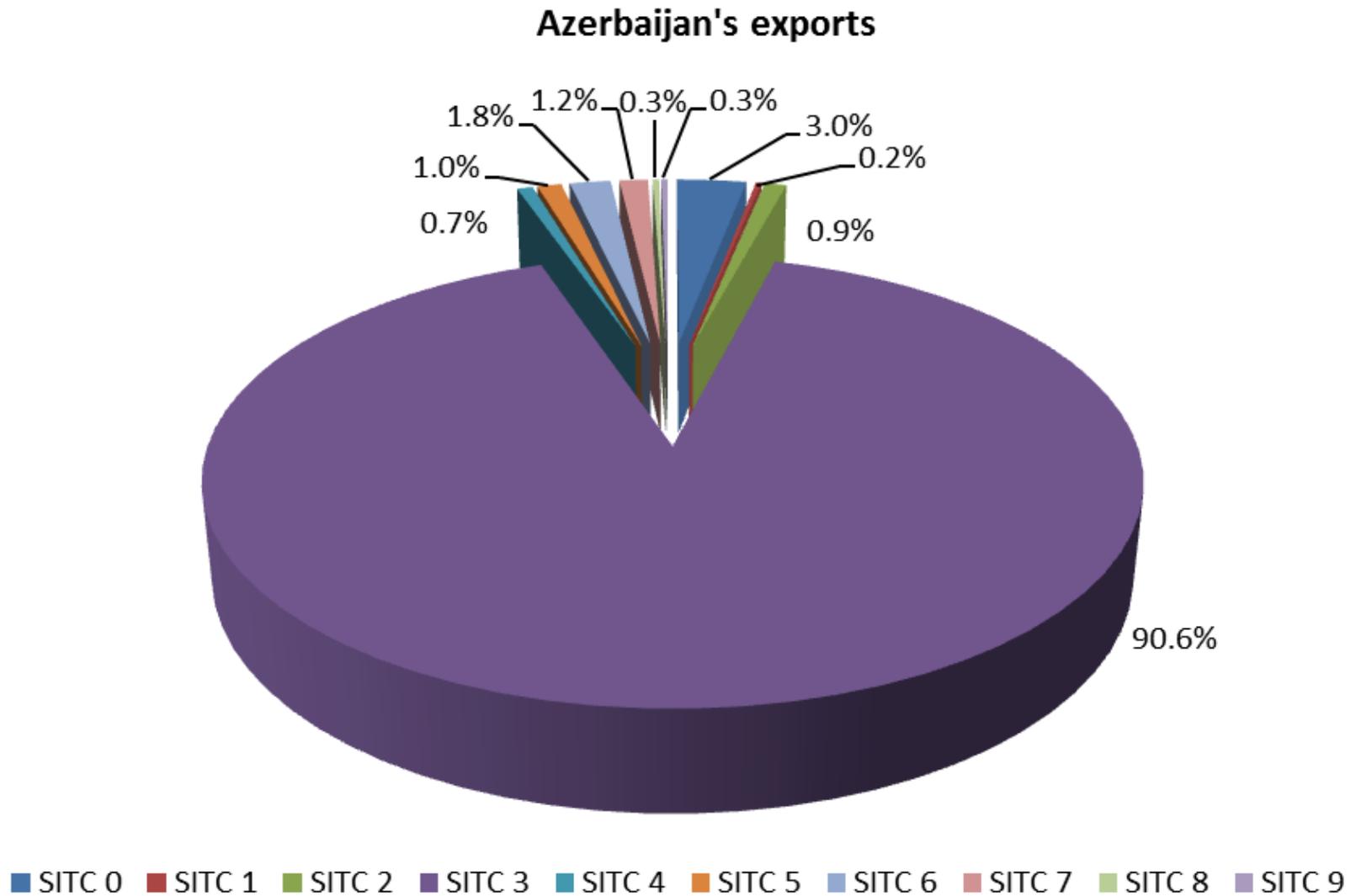
- 1. General characteristic of Azerbaijan's economy; macroeconomic, institutional and policy environment**
- 2. The National Innovation System of Azerbaijan: institutional and regulatory aspect**
- 3. Achievements and challenges in the adoption of green technologies.**
- 4. Policy recommendations on accelerating the adoption and diffusion of innovative green technologies in Azerbaijan**

# **Azerbaijan's economy**

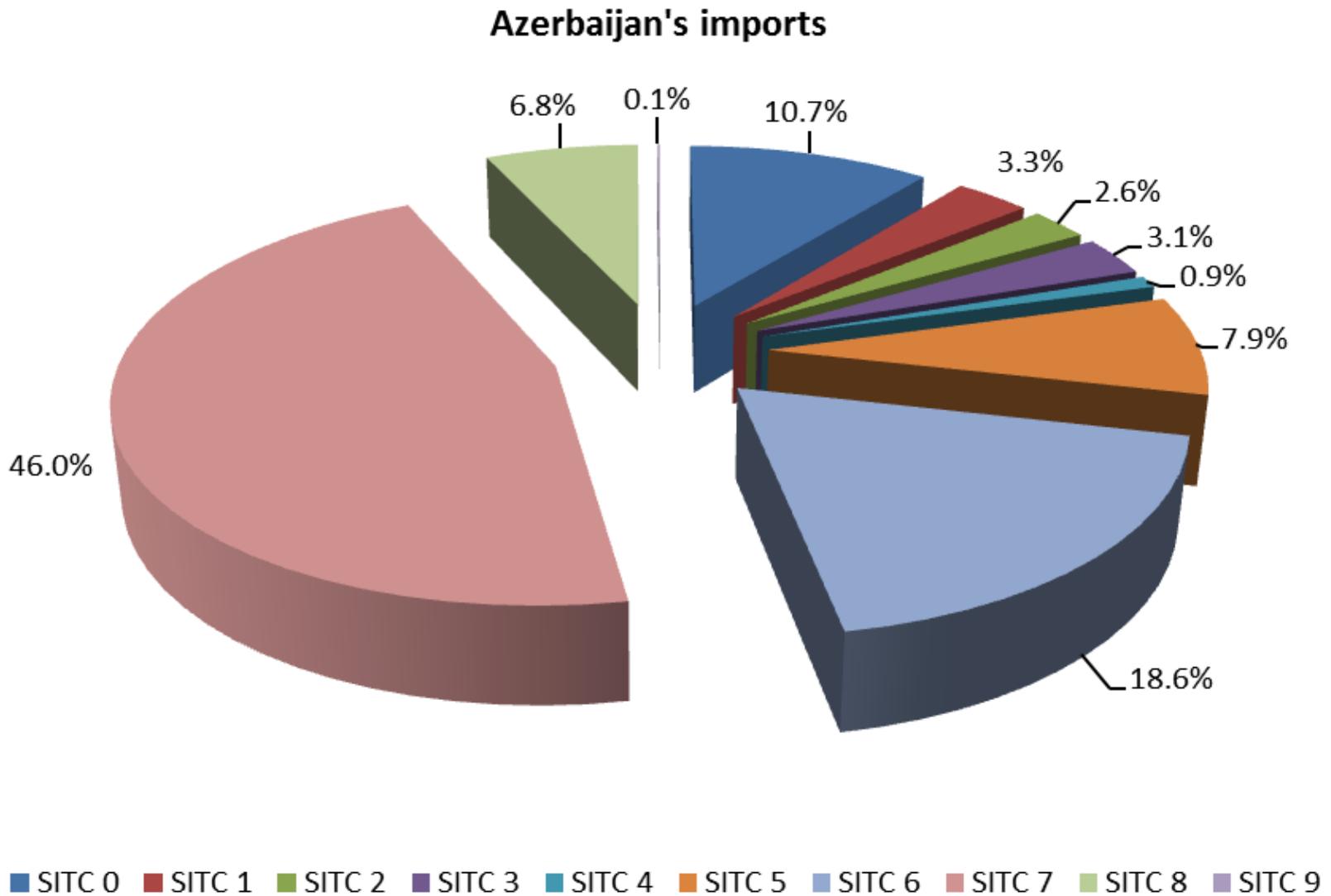
# The economy of Azerbaijan

	2007	2008	2009	2010	2011
GDP at constant prices, annual % change	25.0	10.8	9.3	5.0	0.1
Of which: Oil sector	36.8	7.0	14.8	5.0	-9.8
Non-oil sector	12.0	17.2	3.0	7.6	9.4
Share of Oil sector in GDP, %	64.4	62.1	54.6	55.7	
GDP at current prices, million USD	33050	48853	44297	52909	64781
Gross industrial production, real, annual % change	24.0	6.0	8.6	2.6	-5.0
Gross fixed investment, real, annual % change	23.8	31.8	18.4	18.5	21.2
Share of gross fixed investment in GDP, %	21.5	19.8	18.9	19.0	25.2
Share of exports in GDP, %	18.3	97.8	33.2	40.4	41.0
Share of imports in GDP, %	17.3	14.7	13.8	12.5	15.1
Total foreign investment (direct and portfolio), million USD	6674.3	6847.4	5468.6	8247.8	
Of which: Oil sector	4071.5	3354.2	2413.7	2957.3	
Of which: Financial credit	1576.6	2357.9	1438.3	3405.9	
Total foreign investment, % of GDP	20.2	14.0	12.3	15.6	
Consolidated government fiscal balance	2.6	20.3	7.0	14.6	13.3
Oil fund assets, million USD	2475	11219	14900	22766	28730
Current account balance (- deficit), % of GDP	27.3	35.5	23.0	28.0	26.5

# The structure of Azerbaijan's exports



# The structure of Azerbaijan's imports



# Azerbaijan's economy: brief summary

- Azerbaijan is richly endowed with oil and gas resources
- In the past 10-15 years Azerbaijan was among the fastest growing economies (thanks to new discoveries)
- The economy which is clearly skewed towards the extraction of hydrocarbons.
- Azerbaijan is offering a relatively favourable business environment and is open to foreign investors
- Azerbaijan is facing a number of environmental challenges which makes a strong case for developing the green economy and promoting eco-innovation.
- Key sectors for eco-innovation: Hydrocarbons; Energy; Transport; Water and sanitation; Waste management

# **The National Innovation System of Azerbaijan**

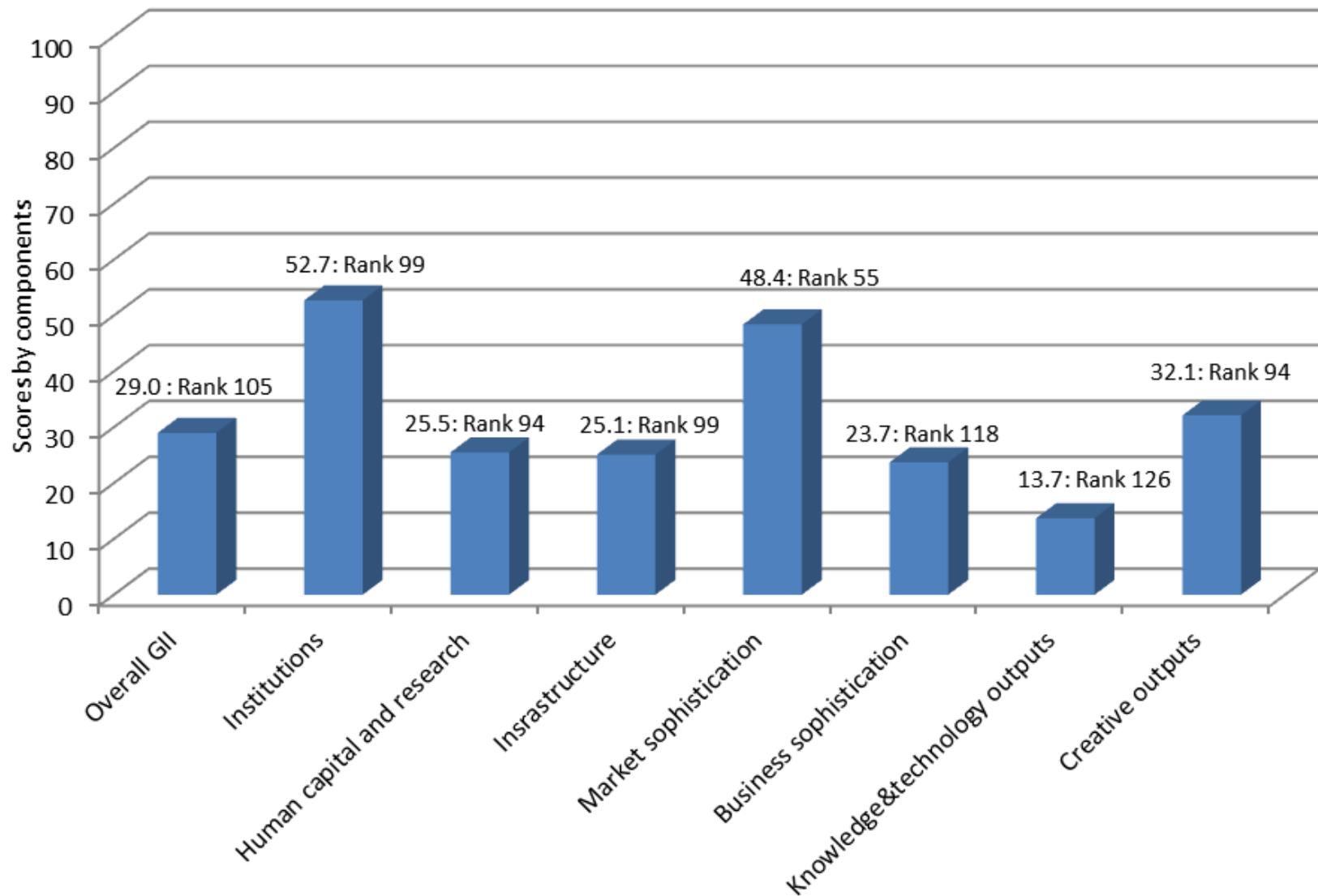
# Specific characteristics of the national environment and context

- **The legacies of the Soviet past. Before independence science and R&D activities in Azerbaijan followed the traditional Soviet model of central planning and control and a linear type of linkages from research to product development;**
- **The disintegration of traditional economic, industrial and trade links which rendered much of the local industry and the related R&D obsolete under market conditions;**
- **The unusually high dominance of the oil and gas sector in the national economy coupled with an almost complete lack of local high-tech consumer goods industries, a sector that is usually a key driver of innovative activity in mature economies.**

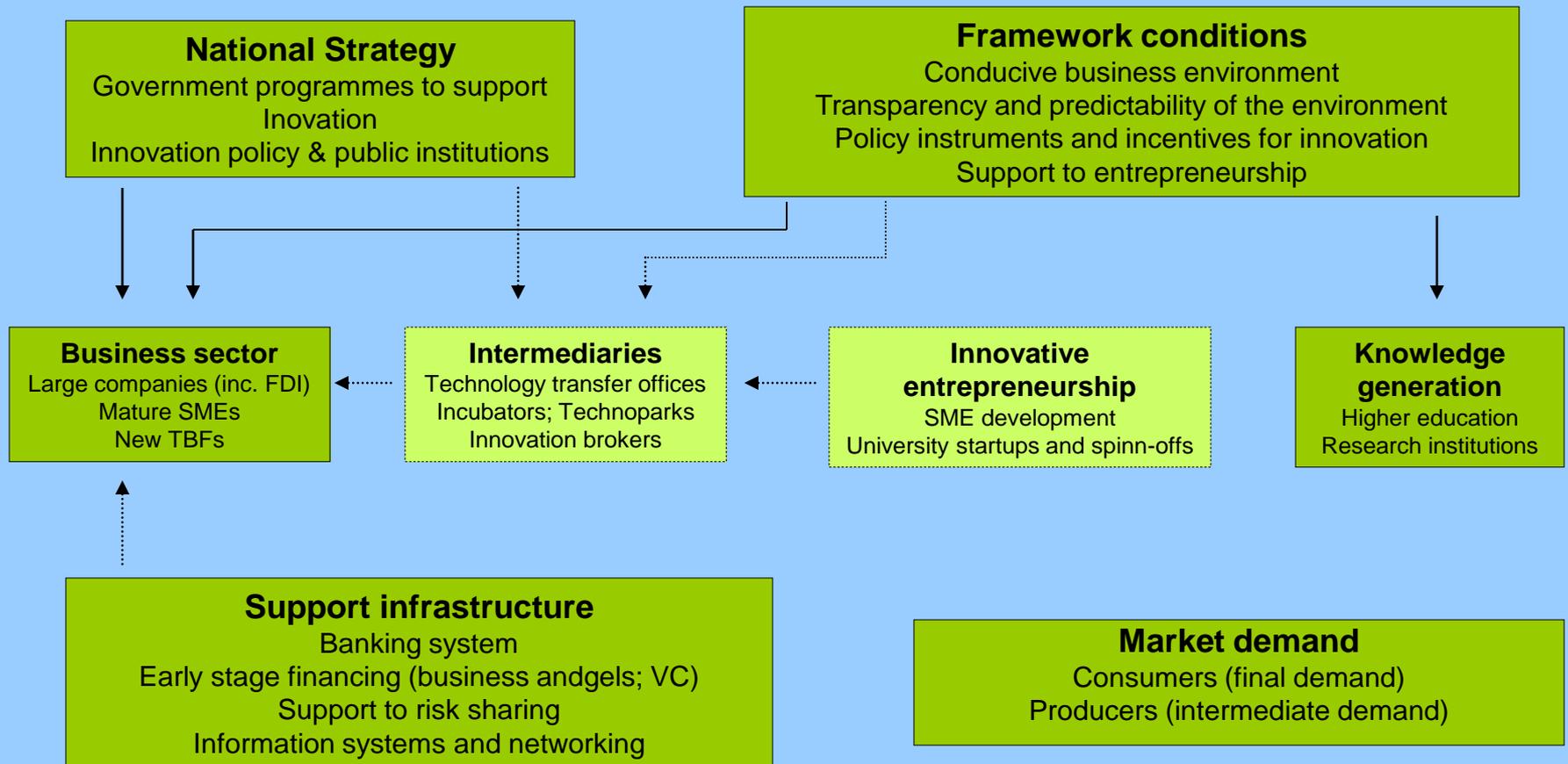
# Science and technology in Azerbaijan

	2008	2009	2010	2011
Gross expenditures on research and development, mn manat	67.0	89.2	93.4	111.1
of which: financed by the public sector, %	77.1	78.0	80.6	82.2
financed by the business sector, %	22.9	22.0	19.4	17.8
Gross expenditures on research and development, % of GDP	0.18	0.25	0.22	0.22
Public expenditures on R&D, % of total public expenditure	0.6	0.8	0.8	0.7
Number of organizations undertaking R&D	146	148	145	143
Number of employed persons engaged in R&D	17942	17401	17924	18687
Innovative products as % of total industrial production	23.0	3.2	15.7	37.6

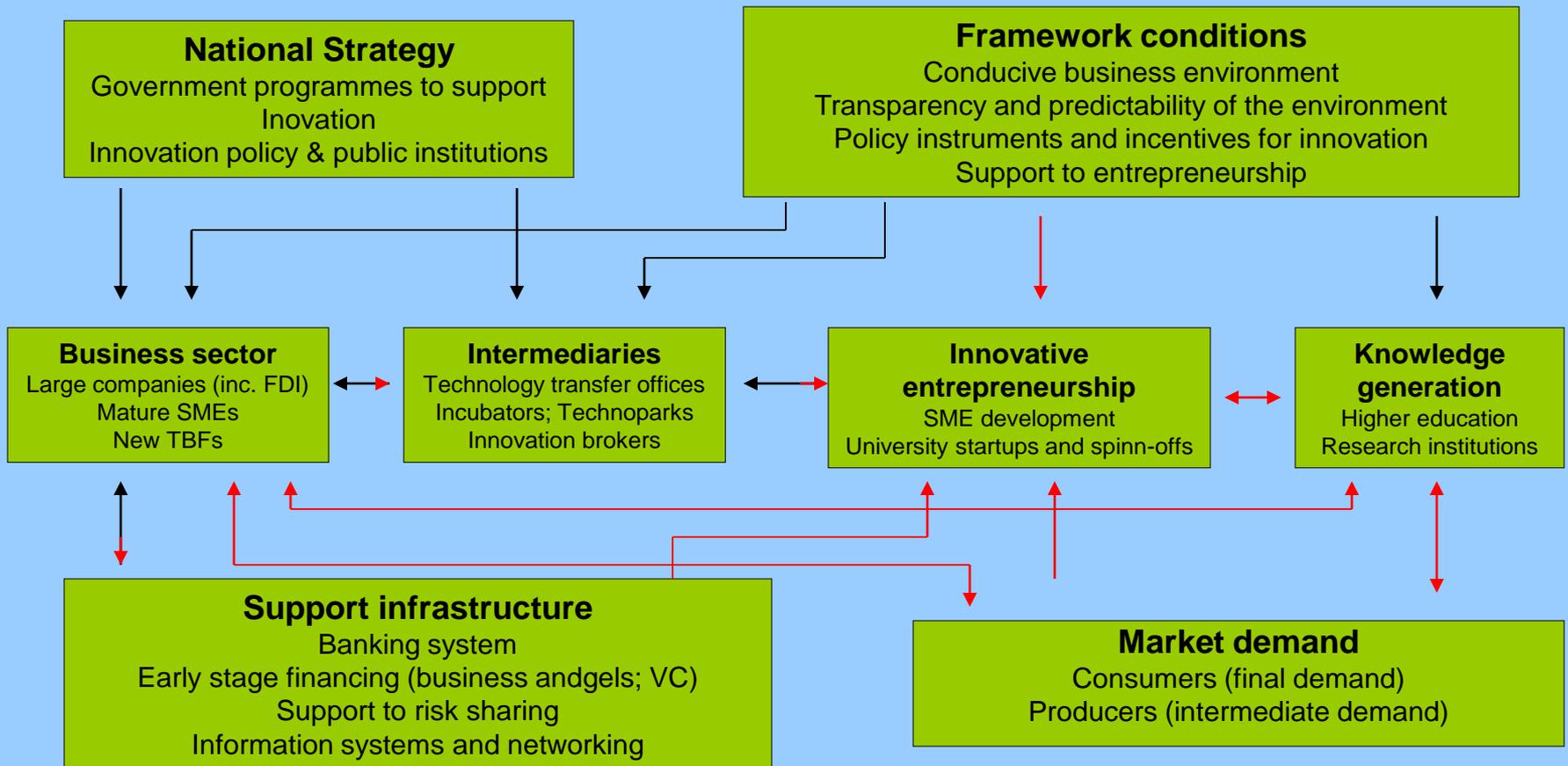
# Azerbaijan in the Global Innovation Index 2013



# The National Innovation System (NIS) of an emerging economy: today ...



# ...and in the future



# Public bodies tasked with NIS responsibilities

- **Azerbaijan National Academy of Sciences (ANAS)**
  - organizing and managing scientific activity in the country and identifying the directions of the national S&T policy
  - National Coordination Council on the Organisation and Coordination of Scientific Research
- **Ministry of Economic Development**
  - takes part in the formation of national innovation and S&T policy
- **Ministry of Communications and Information Technologies**
  - formulating and implementing public policy in the area of ICT (a high priority sector) and the related regulation
- **State Committee for Standardization, Metrology and Patents**
  - public policy and regulation in standardization, metrology, quality control as well as in the protection of industrial property rights

# Other NIS building blocks

- **Science Development Foundation**
  - six calls for project proposals were completed by end-2012
  - funding amounting to some 25 million euro was allocated to 155 projects
- **ICT Development Fund**
  - funding from the budget the State Oil Fund of Azerbaijan
  - project support through concessional funding (loans and grants) to companies, including small innovative companies and S&T start-ups
- **Still underdeveloped components**
  - intermediaries (technology transfer offices; incubators; technoparks; innovation brokers)
  - early stage financing
  - innovative entrepreneurship, SME sector

# Azerbaijan's NIS: some challenges

- Azerbaijan's NIS is still in its early development stages
- Some important NIS institutions are still missing
- Insufficient incentive mechanisms to stimulate innovation and innovative entrepreneurship
- The knowledge base for innovation is generally weak
- Gap between research and market due to poor industry-science linkages
- Access to capital for start-up companies is problematic
- Great existing potential of the large FDI sector in the hydrocarbons sector but it is underutilized

# **Achievements and challenges in the adoption of green technologies**

# Strategic orientation towards green innovation

- **The authorities have repeatedly asserted their support for sustainable, environmentally-friendly development pattern for the country**
- **A range of national strategic policy documents that affect green growth and green innovation have been adopted in Azerbaijan**

# Policy documents on eco-innovation

Year	Document	Horizon
1998	National Environmental Action Plan	2003
2003	State Program on Environmentally Sustainable Social and Economic Development State Programme on Poverty Reduction and Sustainable Development	2010 2005
2004	State Program on the Use of Alternative and Renewable Energy Sources in the Republic of Azerbaijan State Programme for the Socioeconomic Development of the Regions	2013 2008
2006	Comprehensive Action Plan on Improvement of the Environmental Situation in the Republic of Azerbaijan National Strategy and Action Plan on Biodiversity Conservation and Sustainable Use	2010 2009
2008	State Programme on Poverty Reduction and Sustainable Development State Programme on Renewable and Alternative Sources of Energy National Programme on the Rehabilitation and Expansion of Forests	2015 2015 2015
2009	State Programme for the Socioeconomic Development of the Regions	2013
2010	Program on Technical Regulation and Standardization System Development in Energy Saving	...
2012...	National Strategy on the Use of Alternative and Renewable Energy Sources	2020

# The institutional environment for green innovation

- **A range of public bodies are tasked with functional responsibilities in the area of green-growth development**
  - Ministry of the Environment and Natural Resources (MENR) – leading agency
  - Ministry of Industry and Energy, the Ministry of Economic Development, the Ministry of Agriculture, the Ministry of Education, the Ministry of Health, the Ministry of the Interior, the Ministry of Justice, and the Ministry of Transport
- **Below the ministerial level, several agencies or committees are assigned with complementary or implementation functions**
  - State Company on Alternative and Renewable Energy Sources
  - Tariff Committee of Republic of Azerbaijan

# Participation in the multilateral environmental protection agreements and programs

UN Framework Convention on Climate Change (New-York, 1992)
Kyoto Protocol (Kyoto, 1997)
Convention for the Protection of the Ozone Layer (Vienna, 1985)
Montreal Protocol on Ozone Depleting Substances (Montreal, 1987)
United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (Paris, 1994)
Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel, 1989)
Convention on POPs (Stockholm Convention)
Convention on Wetlands of International Importance (Ramsar Convention)
Convention Concerning the Protection of the World Cultural and Natural Heritage
International Convention for the Prevention of Pollution from Ships
Convention on Long-Range Transboundary Air Pollution (Geneva, 1979)
Convention on the Transboundary Effects of Industrial Accidents
Convention on the Protection and Use of Trans-boundary Waters and International Lakes Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus, 1998)

# Policy instruments to support eco-innovation

- **Public procurement**
  - public procurement law of 1994
  - green public procurement has been recommended in all sectors
- **Mandatory technical standards**
  - Law on the Utilization of Energy Resources of 1996: “...State power standards shall determine the [...] demands for the energy resources and the renewable power sources.”
  - Technical Regulation and Standardization System Development in Energy Saving programme (2011): envisages putting in place some 70 national standards affecting energy efficiency
- **International cooperation and donor programmes**
  - Cooperation with the EC, EBRD, UNDP, UNECE and others

# Case studies of eco-innovation in Azerbaijan

- **AzDRES Energy Efficiency Improvement project**
  - undertaken under the Kyoto Protocols' Clean Development Mechanism (CDM)
  - AzDRES is the largest power plant in Azerbaijan, generating half of the country's electricity
  - was financed by the EBRD through a US\$ 207 million loan used to rehabilitate and modernise the plant's technology, significantly increasing the efficiency and capacity of the plant
  - was registered under CDM by the CDM Executive Board and is estimated to generate over 10 million carbon credits over the ten-year crediting period
  - these credits can be sold on global carbon markets, including the EU's Emissions Trading Scheme

# Case studies ... (contd.)

- **Sumgait Technologies Park Solar**
  - infrastructural project focused on the development of renewable and alternative energy sources
  - based on German technology and is designed to produce collectors to harness solar energy for heating
  - future production plans include photovoltaic panels
- **Demonstration project of hydro-electric power plant**
  - a new hydro-electric power plant funded by EU and Norwegian Gvt
  - demonstrating the feasibility of this renewable energy source
  - identifying the optimal types of renewable power for different regions
  - identifying geographic areas with potential for sustainable power generation
  - training and education to target groups and beneficiaries on sustainable energy

# Challenges in promoting eco-innovation

- There is broad awareness of the need to promote eco-innovation
- An area that needs further development is the translation of proclaimed strategic policy goals and objectives into operational policies and working instruments
- Green public procurement has been recommended in all sectors but progress so far is modest.
- Positive experience in demand-oriented policies can be broadened
- International cooperation has played an important role for the promotion of green growth and eco-innovation

# **Some policy recommendations**

# Recommendations to support eco-innovation

- **Complete the establishment of the NIS**
  - support the establishment of missing building blocks (in particular, early finance institutions, innovation intermediaries and SME support institutions)
  - support linkages and interactions within the NIS
  - widen and deepen the range of modern policy instruments
- **Development of a national eco-innovation strategy**
  - should be part of the efforts towards diversification and modernisation
  - should include further raising of public awareness, including the business and academic communities
  - should improve coordination in the area of green growth and eco-innovation in policy design and implementation
  - allocate more public funding to the support of eco-innovation; the State Oil Fund of Azerbaijan (SOFAZ) could develop a specific funding program to this effect

# Recommendations to support ... (contd.)

- **Enrich the policy instruments and measures to support eco-innovation**
  - wider use of fiscal incentives (such as tax incentives or targeted eco subsidies)
  - support the development of physical infrastructure and business development
  - replicate the positive experience of the Sumgait Technology Park
  - establishing a special fund to support R&D and innovation activities targeting future green growth in Azerbaijan
  - encourage R&D and innovative activities of the business sector, which at present do not contribute sufficiently to the generation of knowledge
  - widen and deepen the coverage of university and school curricula to cover relevant teaching courses
  - vocational training programmes re-training of workers in these new technology areas

# Recommendations to support ... (contd.)

- **Policies to stimulate the demand for eco-innovation**
  - apply more aggressively public procurement mechanisms to demand for green products and eco-innovation
  - indirect methods, by stimulating the demand for goods and services that are the product of eco-innovation
  - expedite the introduction of eco-standards and other similar regulations in order to accelerate the transition to green growth and environmentally sustainable development
  - expanding the scope and range of targeted regulatory measures to support the demand for eco-innovation; energy efficiency is one of the areas where there is ample room for improvement

**THANK YOU!**

**Thank you!**

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