



# Green Growth, Catch-up Innovation and National Absorptive Capacity

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# Outline of the presentation

- 1. Special characteristics of green innovation and technologies**
- 2. Need for tandem policy – environment and innovation**
- 3. Frontier, catch up innovation and absorption**
- 4. How to promote catch-up innovation, diffusion and enhance national absorptive capacity**
- 5. What Turkmenistan could do?.**





# Why Green Technologies are important for Turkmenistan?

- **Climate change will have severe impact on Turkmenistan**
- **Key vulnerabilities are water resources and agriculture, that may limit future economic and social development**
- **Green technologies will increase national adaptive capacity, reducing vulnerability to climate change.**





# Example: Major focus areas in Turkmenistan

## Water sector:

- Introduction of innovative irrigation technologies
- Rehabilitation and extension of existing irrigation network
- Continued construction of the artificial Turkmen lake
- Creation of incentives for rational water use

## Agricultural sector:

- Switching to heat, drought and salt-resistant crops
- Switching to less water-intensive crops
- Changes in farming practices (crop rotation, nutrient management).







# Green innovation and technologies – special characteristics?

**Adoption and diffusion of green innovation is often more socially desirable than non-green technologies, given the externality of environmental issues**

**Green innovations needs to be adapted to the local situations (iPhone vs. agricultural technologies) – strong absorptive capacity needed.**





# Why do we need tandem policies?

**No single solution to solve both innovation and environmental challenges**

**For better impacts, both environmental and innovation policies are needed**

**(i.e. research subsidies and carbon taxation is superior in effect compared to only environmental policies).**





# Frontier innovations

**Frontier innovations** - new to the world knowledge

**Most frontier innovations take place in the high-income countries  
Japan, Germany and USA account for 60% of total green  
innovations worldwide between 2000 to 2005 \***

**R & D in the firms play major roles**

**It may not advisable to dedicate significant public resources to  
frontier technologies if you are not ready to compete worldwide.**

**\*GHG mitigation technologies**





# Catch-up innovations and technology absorption

## Catch-up innovations – new to the firm knowledge

To acquire, adapt and use existing knowledge---less costly and less risky than creating new.

Successful emerging economies imported what the rest of the world knew; improve it, and exported in a form what the rest of the world wanted

Their strong absorptive capacity made this possible.







# Absorptive capacity

## Absorption of green technologies implies:

- Adoption of a new green technology product or process developed elsewhere
- Upgrading of an old green technology product or process, and using a green-technology license.



# How to grow innovation plants?

## Government as gardener

- **Discovery and importing seeds**
  - Access to information, diaspora, open trade
- **Planting seed and growing plants**
  - Joint ventures, FDI
- **Watering**
  - Financing
- **Preparing ground = good absorption capacity**
  - Good education, entrepreneurship, basic technological literacy
- **Removing weeds**
  - Poor business environment
- **Improvement of the seed**
  - Catch-up innovation – R & D.





# Innovation policy priority for emerging economies

**To invest in catch-up innovation, rather than frontier innovation**

**Build strong absorptive capacity**

**Turkmenistan will be better prepared to the climate change impacts, through adoption and adaptation of existing green technologies.**





# How to foster catch-up innovations and to stimulate technology absorption?

## Access:

**Open trade (imports)**

**Information and Communication Technology policies**

**International collaboration in research networks**

**Diaspora**

## Business facilitation:

**Ease of business, foreign direct investment, labour mobility.**







# How to foster catch-up innovations and to stimulate technology absorption?

**Intellectual Property Rights legislation and enforcement**

**Public procurement, standards and regulations**

**Support for finance to early adopters/demonstrators.**





# How to increase absorptive capacity?

**Empowerment of local human resources:**

**Education and life-long learning policies**

**Enterprise-based worker training, management and entrepreneurship training**

**Technical and vocational education and training.**





# How to increase absorptive capacity?

**Facilitate network with global suppliers**

**Develop linkages to global value chains**

**Rule of law, contract enforcement, competition**

**Bankruptcy and re-entry facilitation**

**Policies to attract and retain talented workers.**





# Recent Educational and R & D reforms in Turkmenistan

- **Academy of Science re-established in 2009**
- **Re-building of PhD programmes**
- **Priority areas for research includes: alternative energy sources, seismology, town planning, environmentally sound production technologies, rational use of land and water resources, and efficient use of natural resources**
- **Increase compulsory education from 10 to 12 years**
- **Infrastructure upgrading – ICT equipment at schools**
- **Fostering regional and international cooperation in R & D (EU Tempus programme, Central Asia Research).**







# Positive Developments in Turkmenistan

**Legal base for the involvement of SMEs in research activities**

**Construction of an industrial techno-park near Ashgabat (2012) for alternative energy sources, nano-technologies, ICT and its application in the production process**

**Establishment of an Academy of Civil Service (2009) to upgrade the skills of government employees.**





# Areas for further Development in R & D and Education

- **More access to technology (ICTs) in education, improve computer literacy among young people**
- **Increase availability of qualified teachers and their retention rates, in rural areas**
- **Introduce more entrepreneurial learning opportunities**
- **More university graduates**
- **Secure good employment opportunities for qualified young graduates.**





# Positive Developments in Turkmenistan- IPR

- Signed WIPO documents on Industrial Property Rights and patent cooperation in 1995
- Law on Inventions and Industrial Design and Law on Trademarks, Service Marks and Places of origin, entered into force in 2008 (include the protection of IPR of foreign investors, including artistic and scientific works, software, patents and other copyrighted item)
- Law on Legal Protection of new varieties of plants adopted in 2011
- Law on Copyrights and Related Rights adopted in 2012
- New State Agency for Intellectual Property, under the Ministry of Economy and Development established in 2012
- Need further administrative and civil procedures and criminal penalties for IPR violations.





# Conclusions: Turkmenistan could consider..

**Facilitate acquisition and use of existing green knowledge---less costly and less risky than creating new. Invest in catch-up innovation, rather than frontier innovation**

**Adapt such innovations and technologies into national and local contexts**

**Build stronger absorptive capacity. Continue good reform efforts in education and in R & D, IPRs. Continue to expand technical access (ICTs) and facilitate international trade of green technologies. Provide enabling environment for FDI and business.**

