Integrating climate resilience into project development and implementation: Practical experience from EBRD Projects

JASPERS Networking Platform: Climate Change Adaptation Event
Brussels, 8th June 2016

European Bank
for Reconstruction and Development

EBRD investment operations

European Bank
for Reconstruction and Development

- Promotes transition to market economies in 35 countries from central Europe to central Asia, promoting private sector investments
- Since 2011, EBRD has expanded its operations to include Egypt, Morocco, Tunisia, Jordan, Cyprus and Greece
- Owned by 65 countries and two inter-governmental institutions, with a capital base of €30 billion
- In 2015 committed €9.4 billion through 381 investment operations

SOUND BANKING

& SUPPORT TO THE PRIVATE SECTOR

TRANSITION IMPACT

& ENVIRONMENTAL SUSTAINABILITY

ADDITIONALITY

EBRD Green Economy Transition

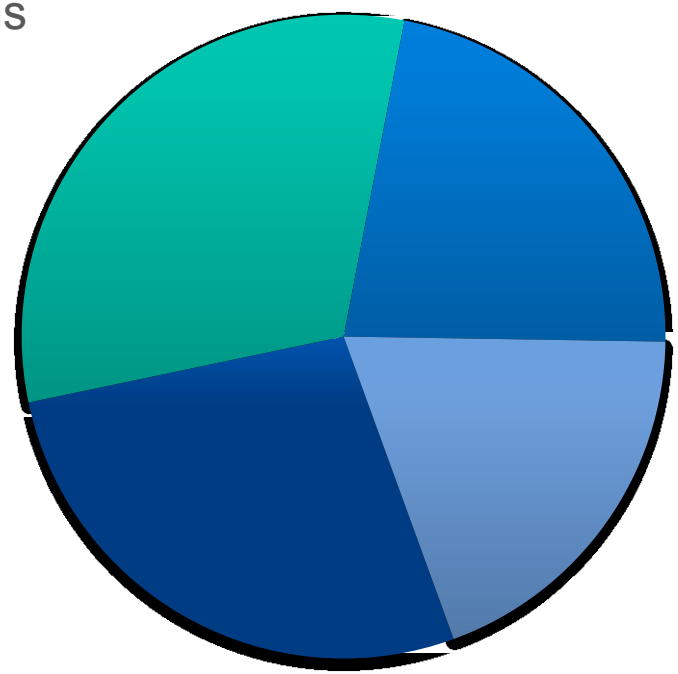
European Bank
for Reconstruction and Development

- Since 2006 the EBRD has adopted cross-sectorial strategies **to mainstream** across the Bank's operations, and **to increase** the share of Bank business represented by measures which enhance the efficient use of energy and resources (water, materials) and contribute to the mitigation of, and adaptation to, climate change.
- The latest strategy, **the Green Economy Transition (GET)** aims to further scale up the Bank's green business, and to include new areas of activity, such as environmental protection and technology transfer.

1994	**2006** Sustainable Energy Initiative	**2013** Sustainable Resources Initiative	**2015** Green Economy Transition
Energy Efficiency banking team	• Energy efficiency • Renewable energy		
		• Water efficiency • Material efficiency • **Adaptation to climate change**	
			• Environmental protection • Technology transfer

Infrastructure and energy investments are priority sectors for EBRD

European Bank
for Reconstruction and Development



Financial Institutions 31%

Bank lending, Bank equity, Small business finance, Insurance and financial services

Corporate 22%

Manufacturing and services, Agribusiness, Equity Funds, Property and tourism, Information and communication technologies

Infrastructure 19%

Municipal and environmental infrastructure, Transport

Energy 27%

Power and energy, Natural resources

Note: as at 31 December 2015

Mainstreaming green financing: The business model

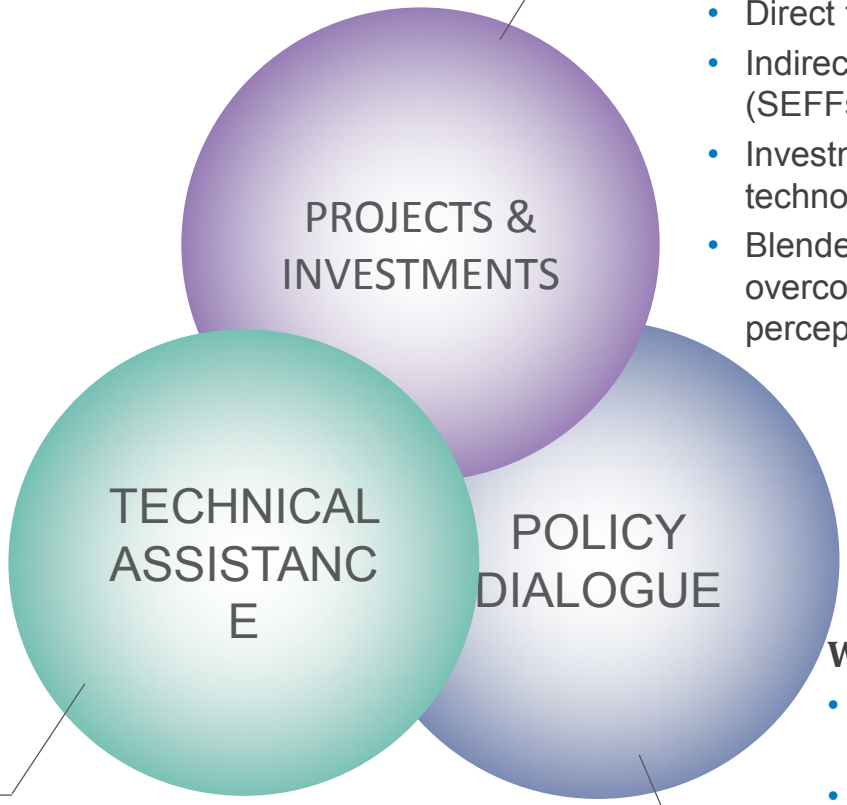
European Bank
for Reconstruction and Development

Tailored financing instruments

- Direct financing
- Indirect-financing via local banks (SEFFs)
- Investment grant support for climate technology transfer
- Blended concessional finance so as to overcome affordability and risk perceptions

Targeted activities:

- Energy and resource audits to identify green investments
- Integrated technical, financial and marketing teams to support client banks in developing sustainable energy lending
- Assessments of risks related to climate vulnerabilities
- Transition gaps and market scoping studies



Working with governments

- To address sustainability and environmental market failures
- To strengthen the institutional and regulatory context and create optimum conditions for green investments to take place

European Bank
for Reconstruction and Development

Investing into Energy Sector in Tajikistan

8 June 2016

Qairokkum: Planning ahead for a changing climate

European Bank
for Reconstruction and Development

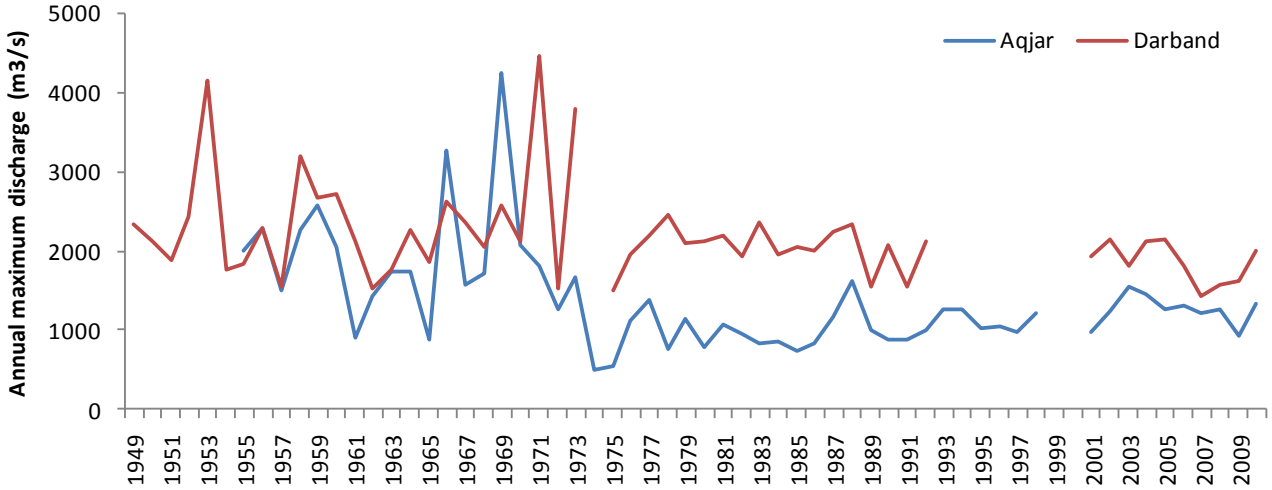
- **Hydropower is a major source of clean energy in Tajikistan, but it is very sensitive to climatic variability and climate change**
  - Climate change will affect hydrology
  - Hydropower operators are concerned about hydrological shifts affecting hydropower facilities
- **Qairokkum is the major energy generation facility in Northern Tajikistan** (126MW), which supplies 500,000 households with electricity in the Sugd region
- **But projected climate change impacts pose risks on the plant's ability to generate electricity -** specifically shifting temperatures and precipitation affecting glaciers and rivers
- Also, mechanical, electric and electronic components had reached the end of their lifetime and equipment breakdowns were increasingly being reported

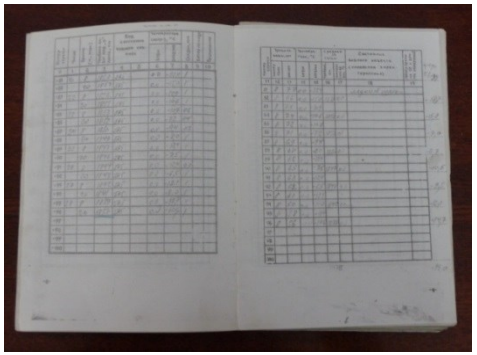
Investment preparatory phase: climate change and hydrological modelling (2010 – 2012)

European Bank
for Reconstruction and Development

Step 1: Data assembly and trend analysis

- Meteorological data from Tajik Hydromet and Kyrgyz Hydromet
- Records on natural disasters (floods, landslides) from the Tajik National Committee for Emergencies
- Data and model outputs from IPCC sources
- **Sector Study:** Funded by USD 300K grant from PPCR

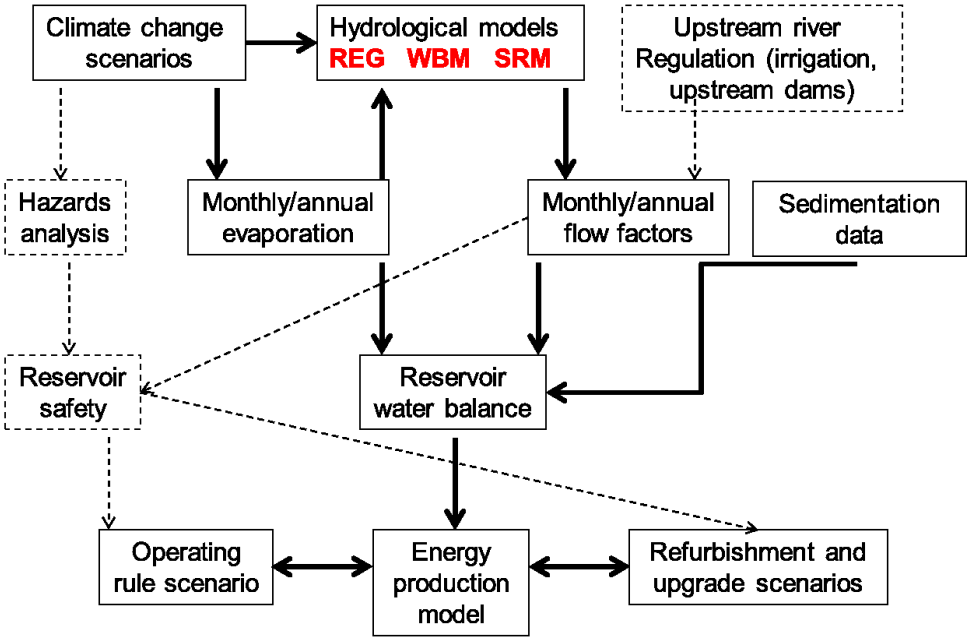




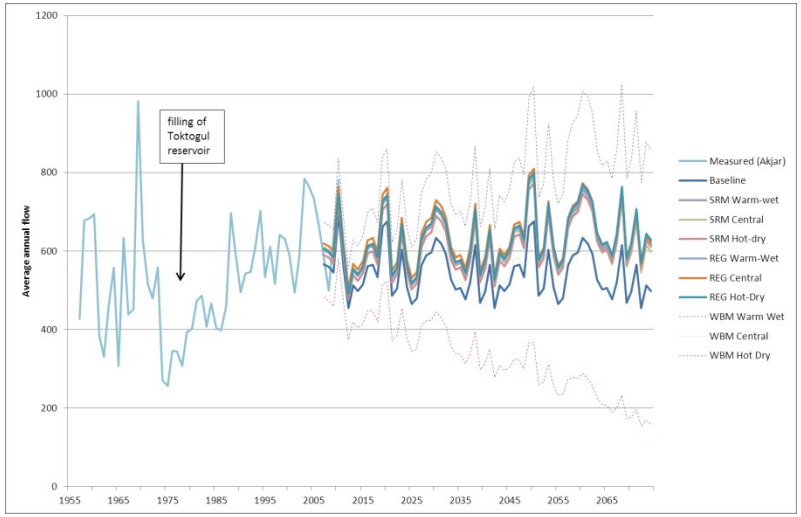
Investment preparatory phase: climate change and hydrological modelling (2010 – 2012)

European Bank
for Reconstruction and Development

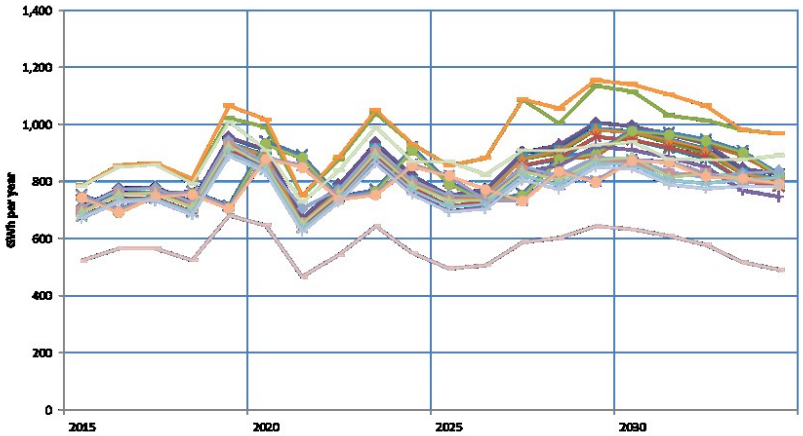
Step 2: Modelling Qairokkum's capacity to generate electricity under different climate change scenarios



Measured/simulated inflows 1957 to 2074



Modelled energy generation 2015 - 2050



Implementation phase: investment design & implementation (2013 - 2016)

European Bank
for Reconstruction and Development

Step 3: Technical options for the rehabilitation of Qairokkum hydropower plant

Net present value (€ million)

Hydro Scenario		Alternative 6 N - 170 MW	7 N - 210 MW	4 N 2 O - 150 MW
Regression Model REG	central	177	143	177
	hot-dry	**171**	**137**	**171**
	warm-wet	171	137	171
Snowmelt Runoff Model SRM	**central**	**170**	**136**	**169**
	hot-dry	163	129	165
	warm-wet	**168**	**134**	**168**
Watershed Bal. Model WBM	central	157	122	161
	hot-dry	**83**	**48**	**93**
	warm-wet	212	183	199

A min-max analysis

Hydro Scenario		Alternative 6 N - 170 MW	7 N - 210 MW	4 N 2 O - 150 MW
Regression Model REG	central	0.0	-33.7	-0.3
	hot-dry	**0.0**	**-34.1**	**-0.2**
	warm-wet	-0.4	-34.5	0.0
Snowmelt Runoff Model SRM	**central**	**0.0**	**-34.1**	**-0.6**
	hot-dry	-2.2	-36.5	0.0
	warm-wet	**-0.5**	**-34.7**	**0.0**
Watershed Bal. Model WBM	central	-4.0	-38.6	0.0
	hot-dry	**-10.9**	**-45.5**	**0.0**
	warm-wet	0.0	-29.1	-12.5
Minimum Regret		-10.9	**-45.5**	**-12.5**

Scenario 1	Scenario 2	Scenario 3
Scenario 1 envisaged a replacement of all turbines. Whilst the new turbines would have the same flow rate – 177m3 per second – their efficiency would be much higher. The plant's generation capacity after the rehabilitation would be 174MW.	Scenario 2 envisaged a replacement of all turbines and the installation of an additional turbine with a generation capacity of 40MW. This would increase the generation capacity of the rehabilitated power plant to 214MW.	Scenario 3 envisaged a replacement of four turbines in the same way as proposed in scenario 1. The remaining two turbines would run as long as they could be maintained in operational condition. Thereafter, electricity generation would continue with four turbines - a scenario thought suitable for climate scenarios under which the water flow into Qairokkum's reservoir would decrease over time.

Implementation phase: investment design & implementation (2013 - 2016)

European Bank
for Reconstruction and Development

Step 4: Financing package: collaboration between EBRD, PPCR and donors

2013 | 2014 | 2015 | 2016

Feasibility Study & Investment Design

- EUR 800 K grant (Austria)

Project Implementation & Technical Assistance

Phase 1: Upgrade of the turbines to increase the hydropower generation capacity to 142MW

- USD 50 m loan (EBRD)
- USD 21 m grant & concessional finance (PPCR)
- USD 4 m technical cooperation grant (SSF, UK DFID)

Embedding climate resilience in Barki Tojik's hydropower operations: capacity building

European Bank
for Reconstruction and Development

Integrating climate resilience in Barki Tojik's hydropower operations

1. *Advanced training:* Technical workshops with Barki Tojik and Hydromet that focuses on climate diagnostics, climate risk assessment and seasonal forecasting
2. *Updating operating rules:* Support to Barki Tojik for developing dam management practices that maximise energy production, minimise spills and optimise dam safety including technical support to improve flood emergency responses
3. *Facilitating data management and information sharing:* Support to Barki Tojik, Hydromet and other relevant organisations in data management and record keeping. This also includes the development of a protocol that sets out the provisions for sharing and using climatological and hydro-meteorological information in hydropower operations

Supporting Barki Tojik to move towards international best practice through information sharing and learning

1. *Building long-term partnerships:* establish long-term collaborative links with international partners in research, engineering and academia around specific PPCR tasks
2. *Learn from international best practice*: conduct a study tour for staff of Barki Tojik, Tajik Hydromet and other relevant institutions to visit hydropower facilities in an OECD country in order to gain first-hand experience of best practice in managing climate risks to hydropower operations
3. *Capacity building:* Support to strengthen national capabilities in climate risk assessment and adaptation in Barki Tojik, Tajik Hydromet and other relevant institutions through the development of partnerships, short-term co-location and two-way exchange of technical staff

European Bank
for Reconstruction and Development

Investing into Port Infrastructure in Poland

8 June 2016

EBRD's port expansion project in Poland

European Bank
for Reconstruction and Development

APPROACH

- Sector highly vulnerable to rising sea levels
- **Feasibility work** included:
  - an **assessment of the risks** of sea level rise and increases in storms an, which indicated that a higher quay was needed, and
  - an **energy efficiency audit** to identify cutting-edge energy efficiency technologies and best practices in energy management.

EBRD's port expansion project in Poland

European Bank
for Reconstruction and Development

OUTCOMES

- EBRD provided EUR 31 million to co-finance the construction of a second deep-water berth at the container.
- The investment recommendations were only partially implemented, possibly due to unfamiliarity with:
    i. the climate resilient measures proposed, and
    ii. risks and opportunities of climate change
- The **long time horizons** in climate-proofing infrastructure investments appear to be a particularly challenging barrier to further adaptation finance in this sector.

Going forward: emerging PIANC guidance

European Bank
for Reconstruction and Development

PIANC
The World Association
for Waterborne Transport Infrastructure

PIANC Working Group 178 on Climate Change
Adaptation for Ports
and Navigation Infrastructure

Thank you

European Bank
for Reconstruction and Development

Marta Modelewska

Policy Manager
Energy Efficiency and Climate Change Team
European Bank for Reconstruction and Development
T: +44 (0) 20 7338 7162
E: modelewm@ebrd.com

One Exchange Square
London EC2A 2JN
United Kingdom

www.ebrd.com




For info or further questions on this seminar and the activities of the JASPERS Networking Platform, please contact:

JASPERS Networking and Competence Centre

jaspersnetwork@eib.org

www.jaspersnetwork.org