



КАБИНЕТ МИНИСТРОВ
КЫРГЫЗСКОЙ РЕСПУБЛИКИ

«КАМБАРАТА-1» HPP PROJECT



КАБИНЕТ МИНИСТРОВ
КЫРГЫЗСКОЙ РЕСПУБЛИКИ

CENTRAL ASIA - OVERVIEW



Countries

Kyrgyz Republic, Kazakhstan, Tajikistan,
Turkmenistan, Uzbekistan

GPD per capita

US \$5,900 (2023; nominal)
[US \$1,200 – \$11,000]

Population

77,039,830 (2022)

GDP

US \$454 billion (2023)



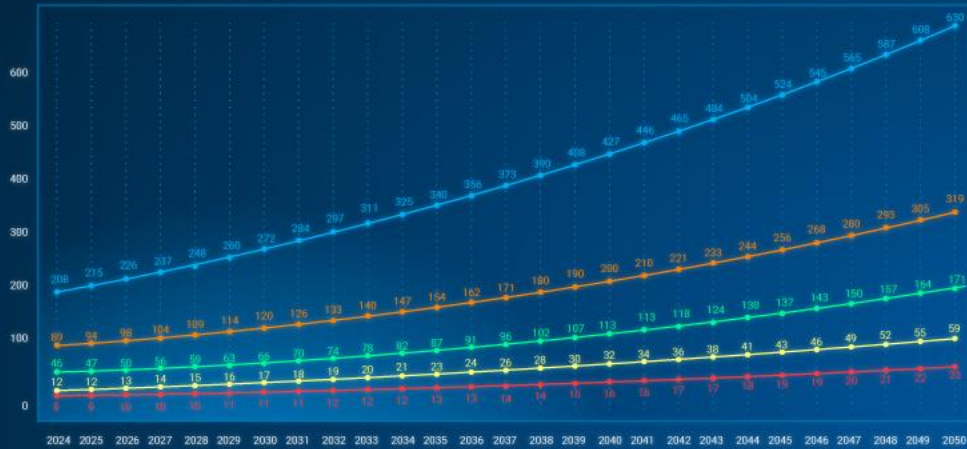
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LONG-TERM FORECASTS FOR CENTRAL ASIA (2050)

(«status quo» scenario)

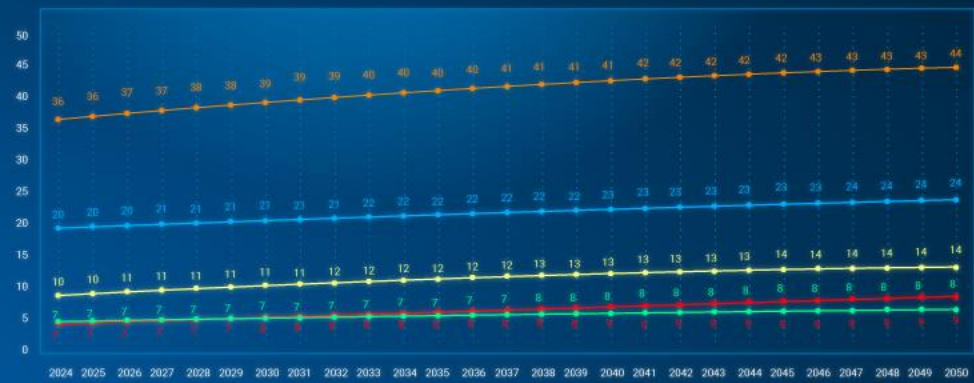
The current economic disparity may persist

Forecast of nominal GDP of Central Asian countries



Population of Central Asian countries +27 % by 2050

Population dynamics of Central Asian countries



Consumption of drinking water in Central Asian countries +50 %

Drinking water demand in Central Asian countries



Demand for food in Central Asian countries +35 %

Food demand in Central Asian countries



Kyrgyzstan

Kazakhstan

Tajikistan

Turkmenistan

Uzbekistan

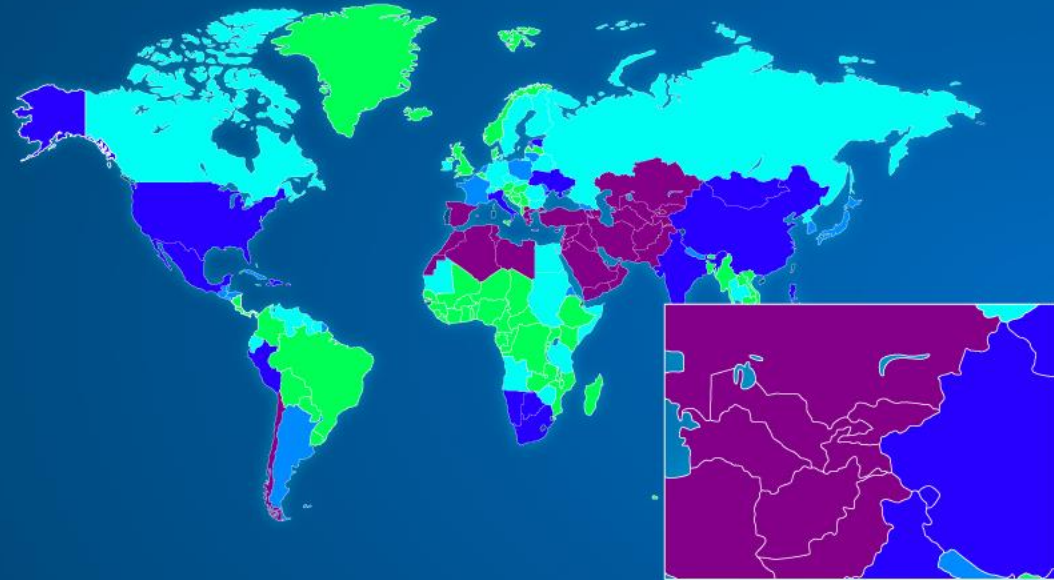


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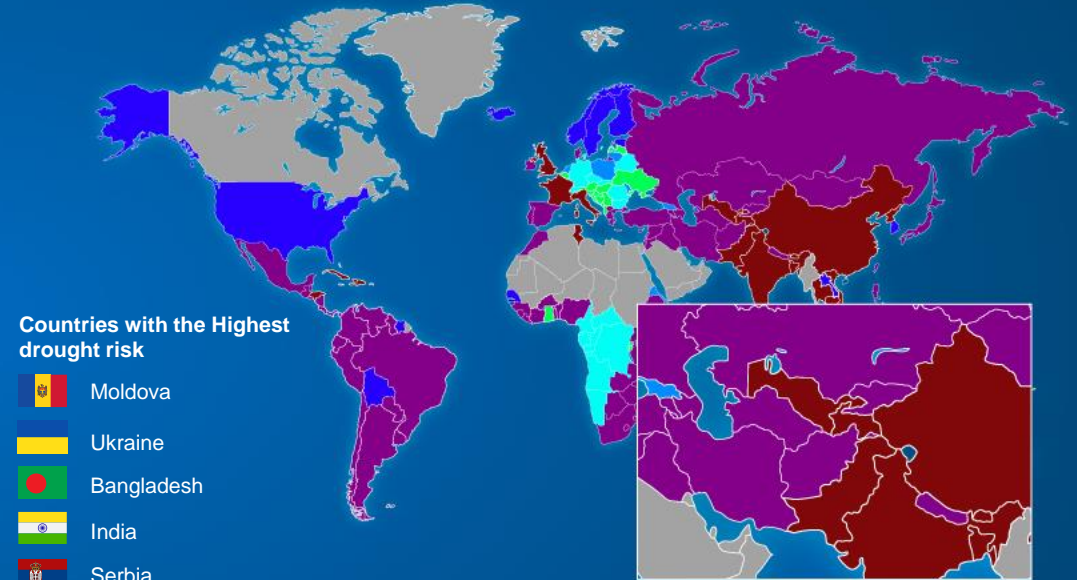
CENTRAL ASIA: CHALLENGES OF THE BLUE ECONOMY

Where Water Stress Will Be Highest by 2040

Projected ratio of water withdrawals to water supply (water stress level) in 2040



World drought risk map



Extremely high (>80 %)

High (>40-80 %)

Medium to high (>20-39 %)

Low to medium (>10-19 %)

Low (>10-19 %)

- Water stress risk forecast is extremely high in Central Asia
- Reservoirs allow water to be stored in high hydrology years and used in dry ones
- Optimized hydro cascades secure energy production, flood protection and irrigation water

High (0.8-1.0)

Medium to high (0.6-0.8)

Medium (0.4-0.6)

Low to medium (0.2-0.4)

Low (0.0-0.2)

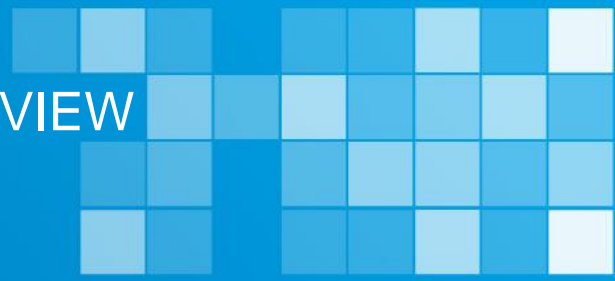
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KYRGYZ REPUBLIC – BRIEF OVERVIEW



3 %

of the total economy of Central Asia



Area

199,951 km²



Population

7,161,900
(January 2024)



GDP (nominal)

US\$ 13,80 billion



GPD per capita

US\$ 1, 969
(nominal)



Inflation

Decreased from **13.9 %**
in 2022 to **10.8 %** in
2023



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КЫРГЫЗСКОЙ РЕСПУБЛИКИ

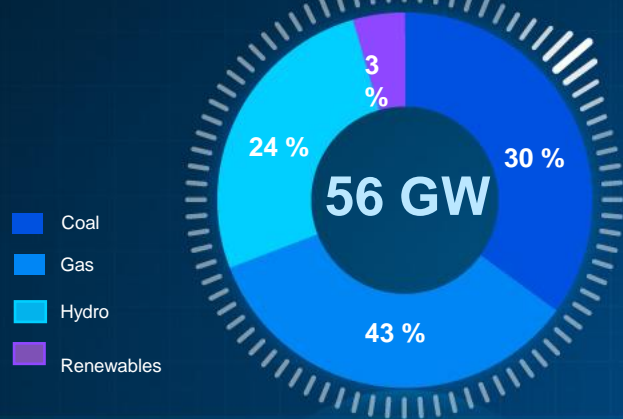




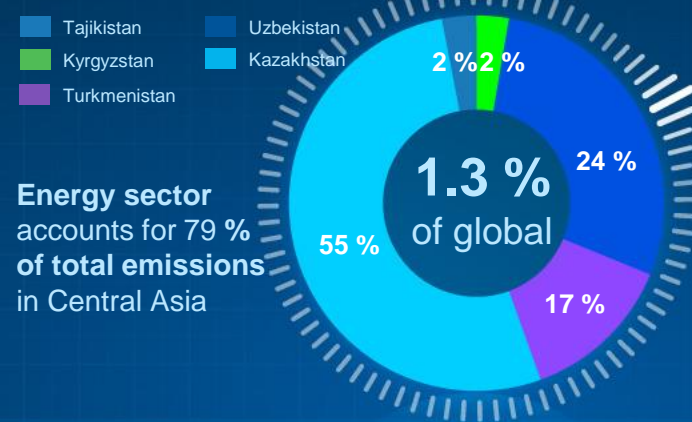
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КЫРГЫЗСКОЙ РЕСПУБЛИКИ

CENTRAL ASIA & KYRGYZ REPUBLIC – ENERGY SECTOR

Electricity Capacity Mix (%)



CO2 emissions %



Energy sector accounts for 79 % of total emissions in Central Asia



Hydro

In Central Asia, energy supply not keeping up with demand growth

Energy shortages esp. during winter season



Wind

In the Kyrgyz Republic, seasonality of demand is even much higher: winter demand 2.5 times higher than that of summer.

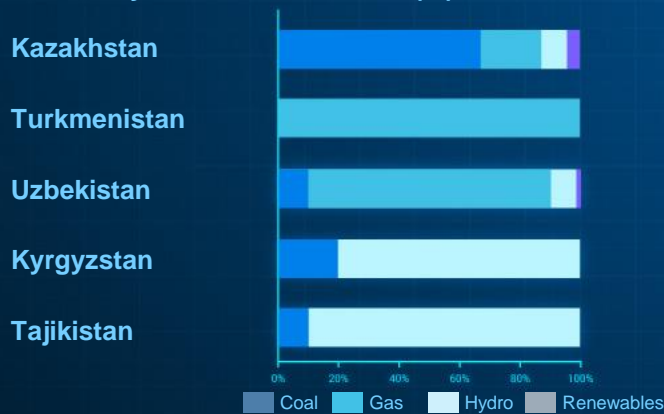
Hydropower and renewable potential is huge yet untapped.



Solar

Energy demand in Central Asia to grow by 40 % by 2030, and triple by 2050

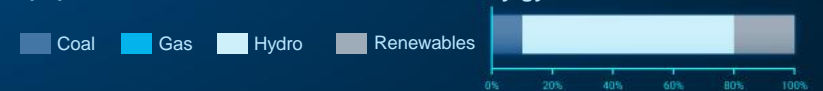
Electricity mix in Central Asia (%)



Kyrgyz republic monthly demand-supply balance for 2025



Energy balance of the Kyrgyz Republic in the case of construction of Kambaraata-1 HPP and renewable sources (%)



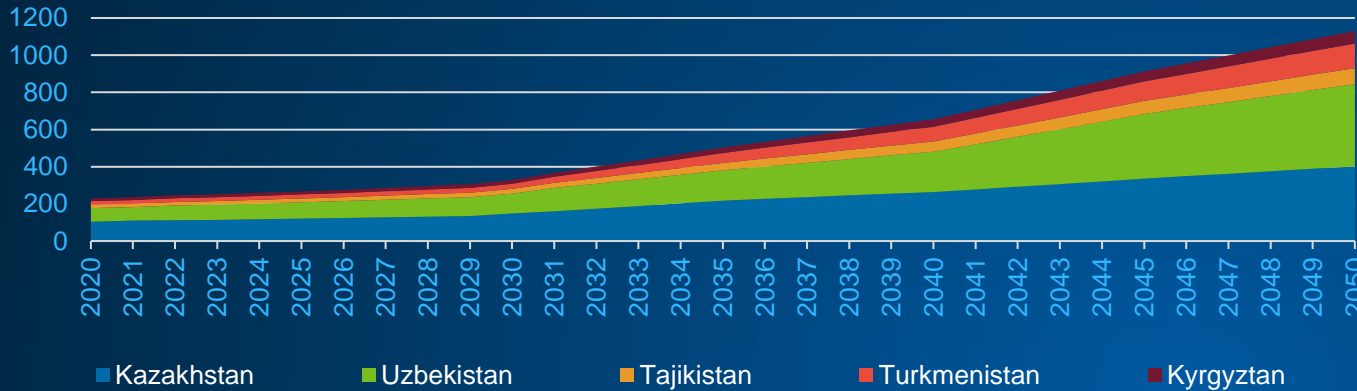


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ELECTRICITY DEMAND PROJECTIONS

Electricity mix in Central Asia (TWh)



Electricity demand in Central Asia (average annual growth rate %)

COUNTRY	2018 to 2022	2022 to 2030	2022 to 2050
Kyrgyzstan	1.3 %	3.3 %	5.5 %
Kazakhstan	1.9 %	3.5 %	4.6 %
Turkmenistan	1.7 %	3.0 %	6.7 %
Uzbekistan	6.8 %	4.0 %	6.4 %
Tajikistan	3.5 %	4.3 %	5.6 %
Central Asia	3.4 %	3.7 %	5.6 %



Ensuring Energy Security: Energy demand in Central Asia to grow by 40 % by 2030, and 3x by 2050 («Net zero» scenario)



Meeting Electricity Demand: Electricity demand in Central Asia is expected to grow at a CAGR of 5,6 % from 2022 to 2050



Covering Power Deficit: Significant power shortages in Central Asia especially during winter season



Creating Regional Trade: Hydropower electricity trade in the region via the CAPS and CASA-1000 project



Clean Energy Transition: Kyrgyzstan is utilizing ~ 12 % of its hydropower potential, indicating significant untapped opportunities



Reducing GHG Emissions: Reduction of GHG emissions in Central Asia by reducing reliance on coal and gas



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KYRGYZ REPUBLIC – ENERGY SECTOR

Tremendous renewable potential



Hydro

In Central Asia, energy supply not keeping up with demand growth

Energy shortages esp. during winter season



Wind

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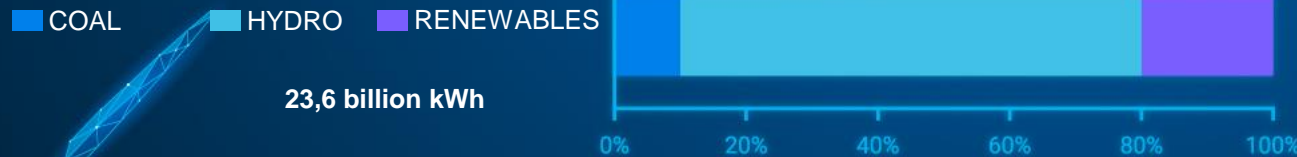
Hydropower and renewable potential is huge yet untapped



Solar

Energy demand in Central Asia to grow by 40 % by 2030, and triple by 2050

Energy balance of the Kyrgyz Republic in the case of construction of Kambaraata-1 and renewable sources (%)



In the case of construction of Kambaraata-1 and renewable sources in Kyrgyzstan, the electricity generation mix will look as follows:

- 11 % - thermal power generation;
- 69 % - hydro generation;
- 20 % - renewables generation.

Solar potential
490 million kW/h

Biomass
1,3 billion kW/h

Hydropotential
142 billion kW/h

Wind potential
44,6 million kW/h



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INVESTMENT OPPORTUNITIES: OVERVIEW

12 Promising Clean Energy Projects: USD 16 billion Investment Opportunities



Cascade	Capacity
Kambarata HPP (National project)	1,860 MW
Kazarman HPPs (National project)	1,160 MW
Chatkal HPP	251 MW
Sary Jaz HPPs	1,100 MW
Upper Naryn HPPs	238 MW
Suusamyr-Kokomeran HPPs	1,305 MW
Kongorochok SPP	100-150 MW
Talas SPP	100-150 MW
Alga SPP	100-150 MW
Chon-Ak-Suu SHPP	11.4 MW
Tar-Kapchygay SHPP	30 MW
Upper Tar SHPP	17 MW



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INVESTMENT OPPORTUNITIES: INVESTMENT INCENTIVES



Financial Incentives

Financial Incentives:

- Privileges and incentives for 15-25 years
- 5-year income tax holiday
- VAT holiday on the import of equipment and goods

Revenue considerations



Revenue considerations:

- 100 % offtake of produced electricity
- Tariff indexation for foreign exchange



Investor Support

Investor Support:

- Protection of investor rights and interests
- Support in land allocation

Market Opportunities



Market Opportunities:

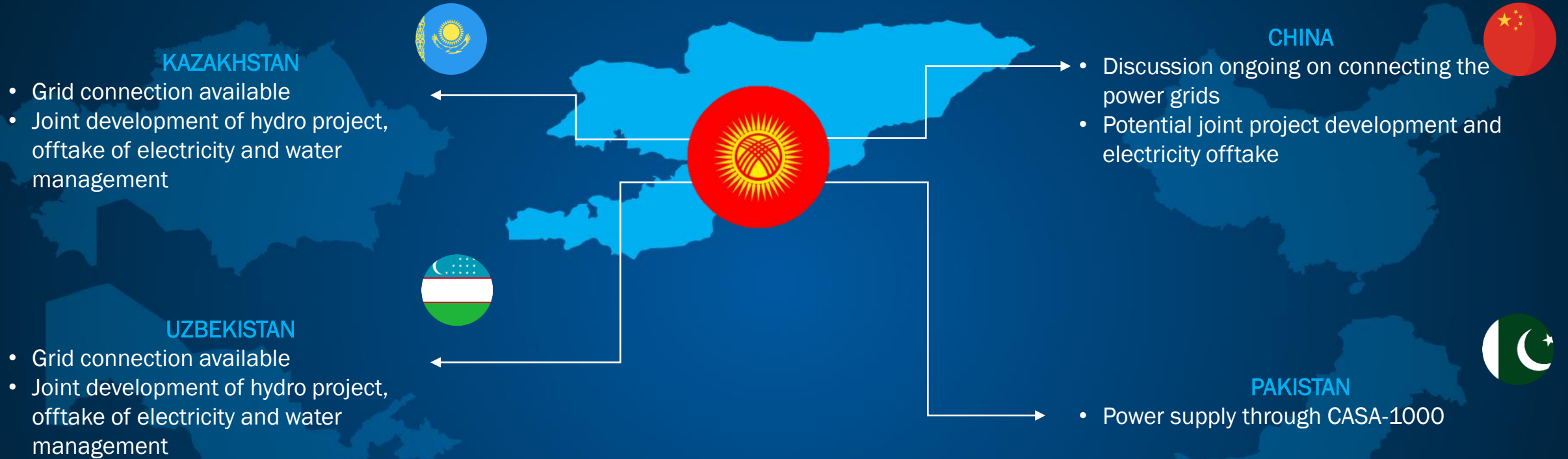
- Electricity export potential to Afghanistan and Pakistan via CASA-1000





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INVESTMENT OPPORTUNITIES: POTENTIAL OFFTAKERS



Hydropower with reservoir storage in the Kyrgyzstan and Tajikistan can help stabilize the grid and integrate other renewables throughout the region. Additionally, the above potential off-takers are pursuing cost-effective, sustainable energy solutions, achievable through the investment opportunities detailed in the subsequent slides



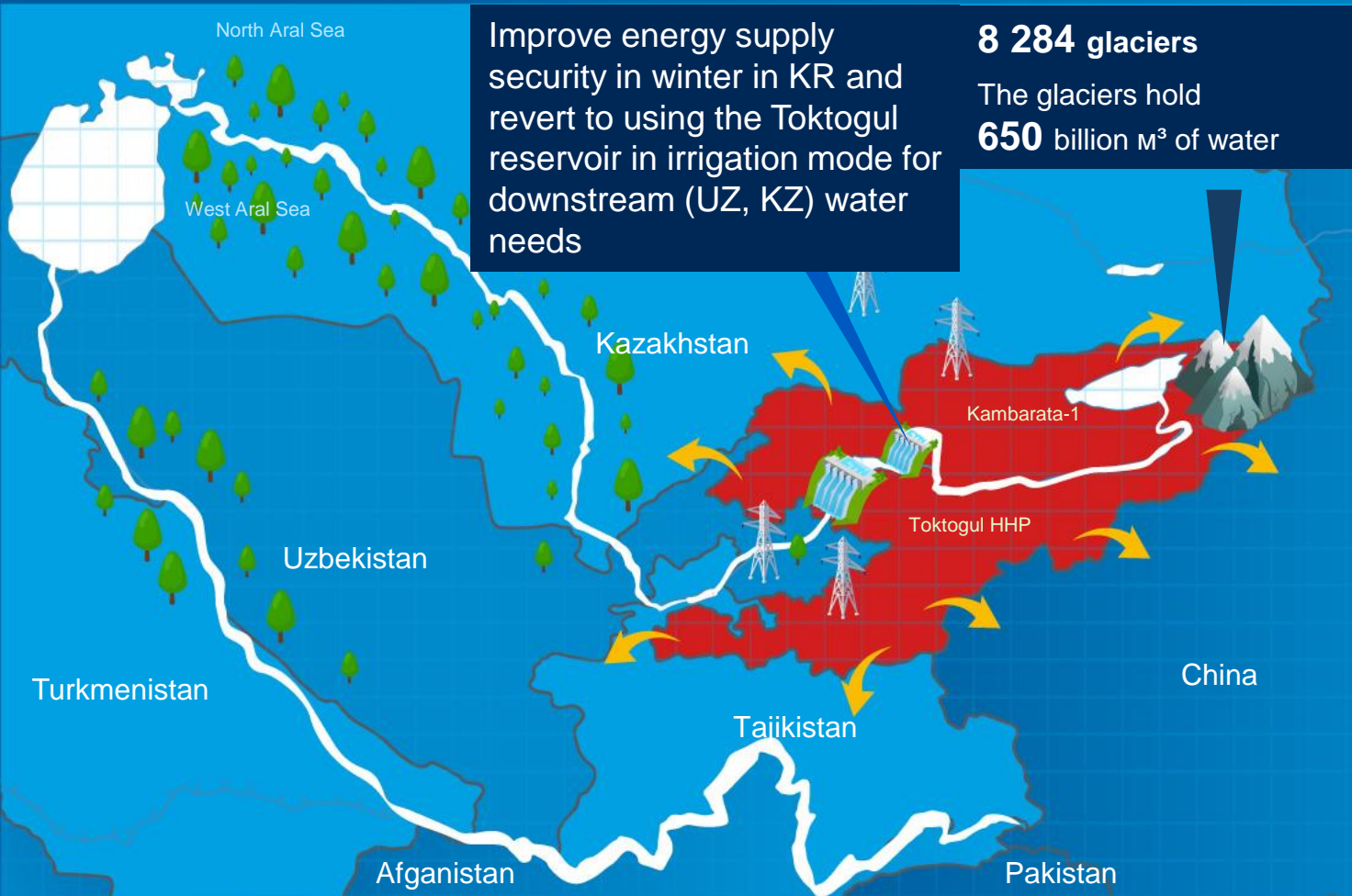
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IMPORTANCE OF THE NARYN-SYRDARYA WATER ARTERY FOR CENTRAL ASIA



Improve energy supply security in winter in KR and revert to using the Toktogul reservoir in irrigation mode for downstream (UZ, KZ) water needs

8 284 glaciers
The glaciers hold
650 billion m³ of water

Toktogul reservoir was designed to regulate the flows for **crop irrigation downstream in UZ and KZ** (peak demand in summer) → water releases for irrigation closely matched natural hydrology

Kamabarata-1 will improve management of water resources → provide electricity to KR in winter and allow Toktogul to release more water in summer for irrigation in UZ and KZ



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Kambarata-1 is a transformational regional project for Central Asia

– and will deliver significant economic, social, and environmental benefits for the region



Energy Security



Clean Energy Transition



Improved Water Management in Central Asia



Least Cost Solution



Manageable E&S Risks

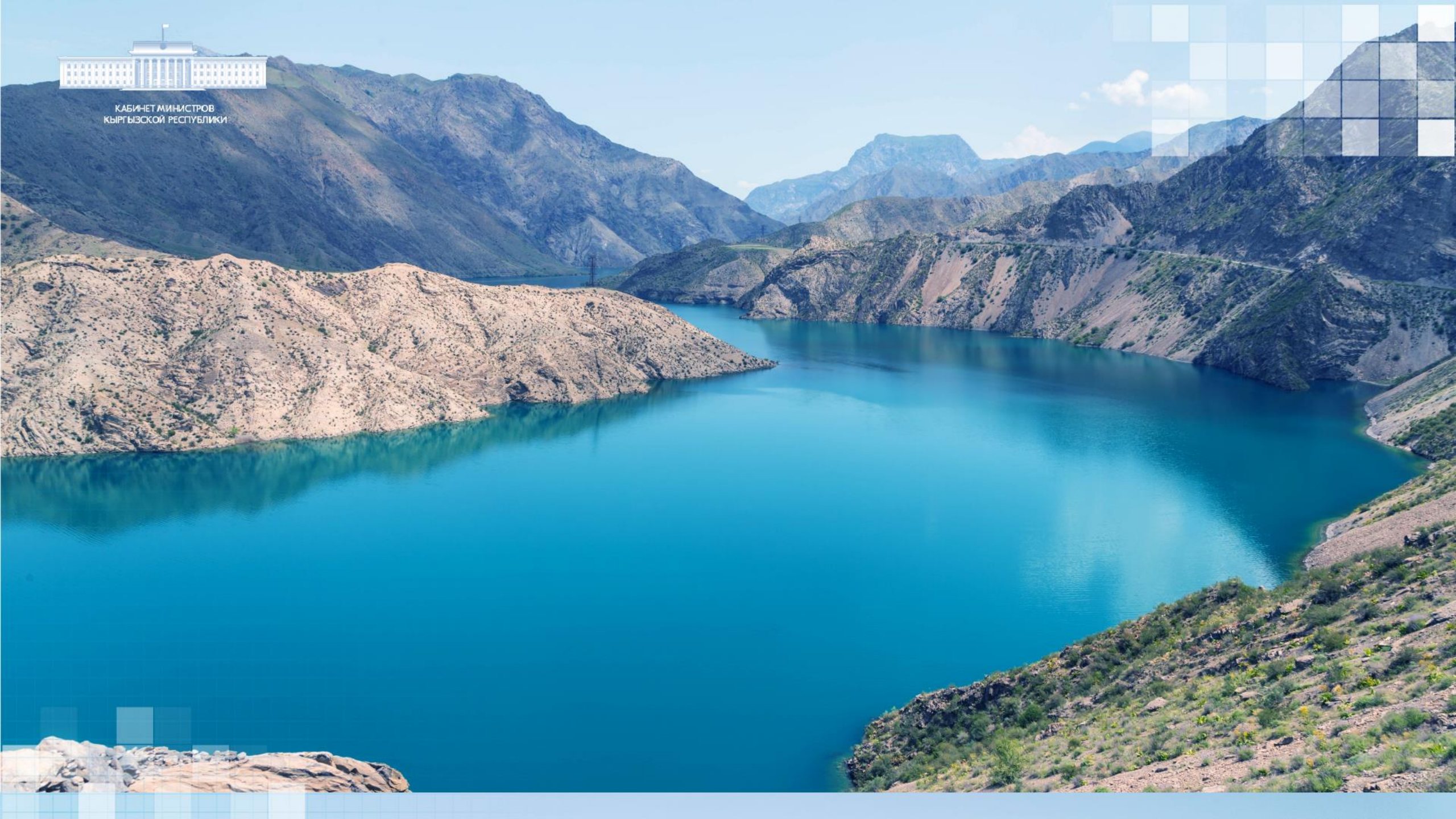


Export Revenue

- **Kambarata-1 is critical to meet the growing energy demand** and **enhance energy security in the region**
- Enable **energy security** by avoiding reliance on imported energy
- **Ramp up power generation toward winter peak demand**, solving the seasonal energy deficits
- **Displace gas and coal fired generation** and **enable large-scale deployment of RE** in Kyrgyz Republic, Kazakhstan, and Uzbekistan through its flexible storage capacity
- **Decarbonize the energy sectors** in Central Asia (now dependent on coal and gas - above 70 %). **Electricity generation at Kambarata-1 will reduce emissions of air pollutants by 31.4 tons per year**
- **Better management of water resources** in Central Asia across seasonal variations, making it possible to **better meet the irrigation and other water needs of downstream countries** (Uzbekistan, Kazakhstan)
- **Least-cost clean energy** in the Kyrgyz Republic and Central Asia, resulting in lowering the costs of energy transition in the region
- **Greenfield project**, with **FS and ESIA** prepared by SNC-Lavalin/ ENEX in 2014
- **Manageable E&S** (no physical resettlement currently anticipated)
- **Larger energy exports revenues for Kyrgyz Republic**
- Broader economic development impacts of Kambarata-1 both for the country and region



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KAMBARATA 1: PROJECT OVERVIEW



Located on the upstream reach of the **Naryn river**



Installed capacity: 1,860 MW (~50 % of current installed capacity in the country)



Dam height: 256 m



Key role in regional water management with reservoir capacity: 5,4 billion m³

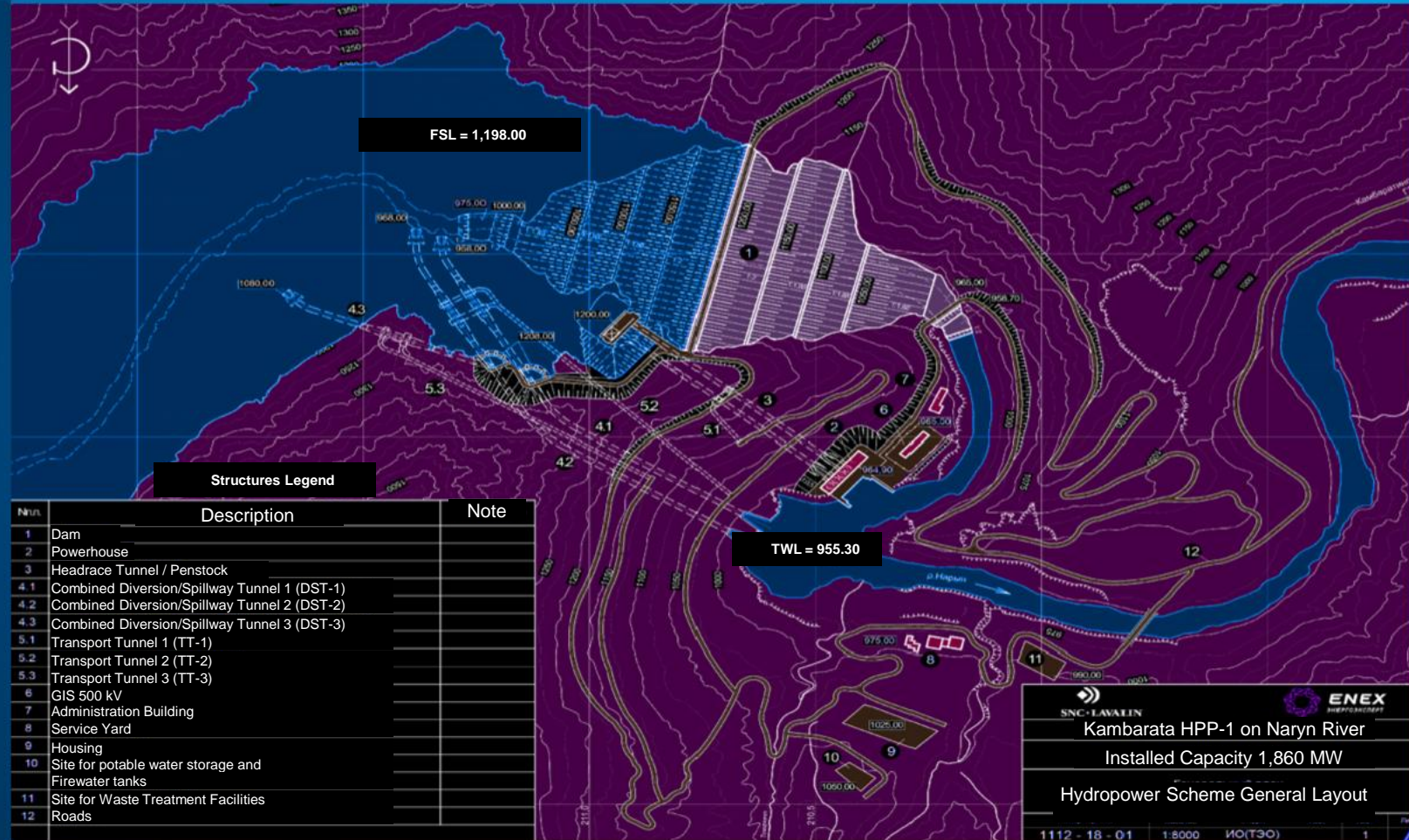


Total generation: 5,640 GWh



Potential consumers:

- CASA-1000
- **Uzbekistan**
- **Kazakhstan**



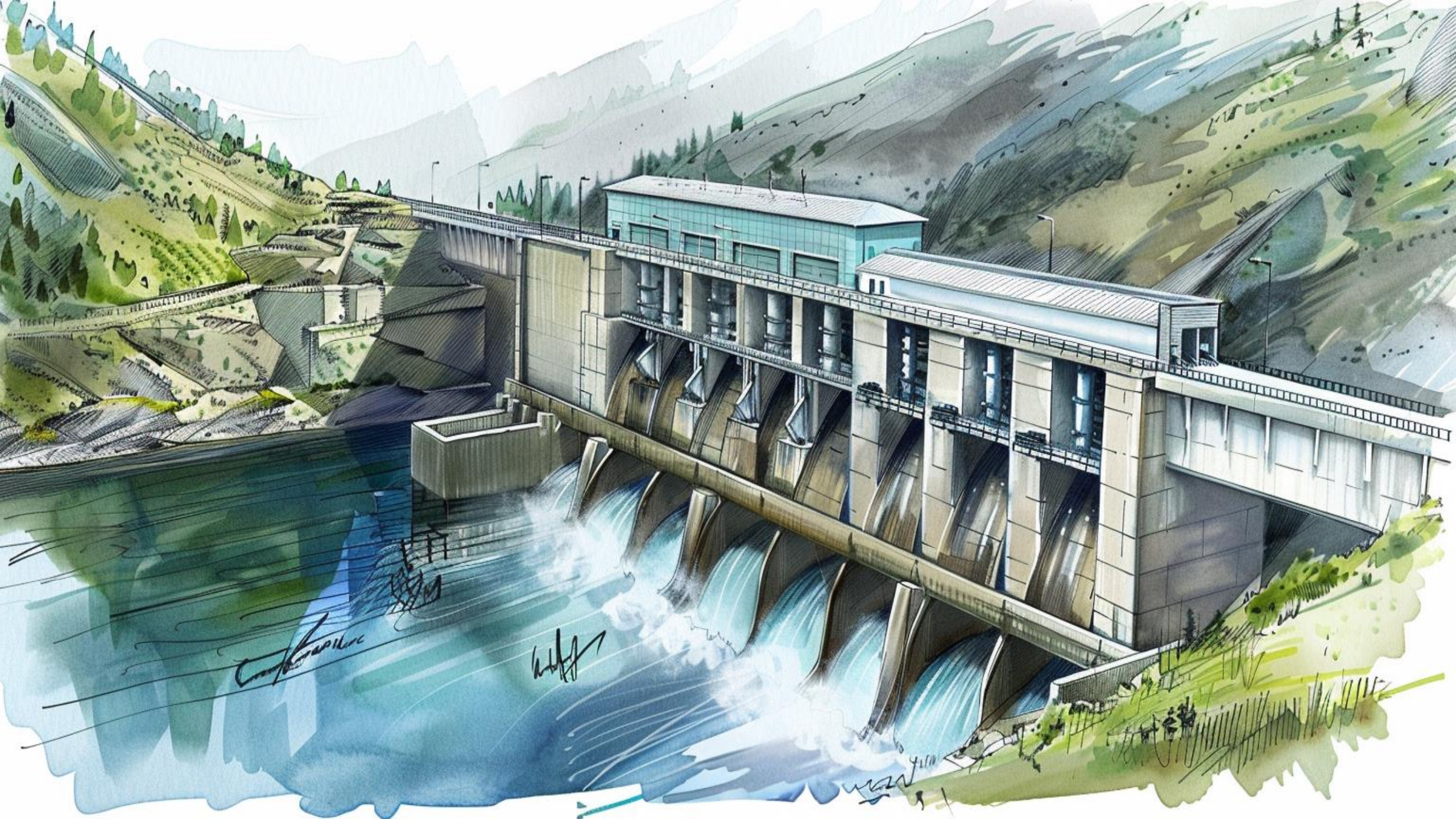
SNC-LAWALIN **ENEX**

Kambarata HPP-1 on Naryn River

Installed Capacity 1,860 MW

Hydropower Scheme General Layout

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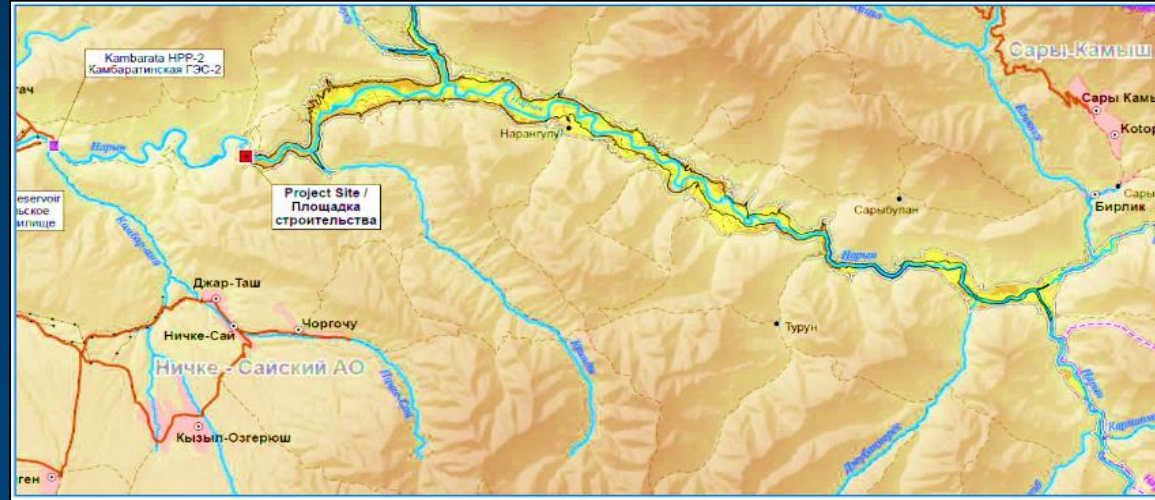




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KAMBARATA-1 HPP: PROJECT OVERVIEW

PROJECT LOCATION



- **Feasibility study and Environmental and Social Impact Assessment** were conducted in 2014. Update of both studies is under way with support from the World Bank
- Rapid assessment as part of the **Power Sector Master Plan** also confirmed the priority of the project in 2022
- To be connected to the adjacent existing **500 kV Dakta-Kemin** line with a short (1,5 km) link
- Site preparation works are underway using **Kyrgyzstan's own funds and expected to be completed by 2025** (construction of road, transport tunnel and bridge, site power supply, workers camp, etc.)



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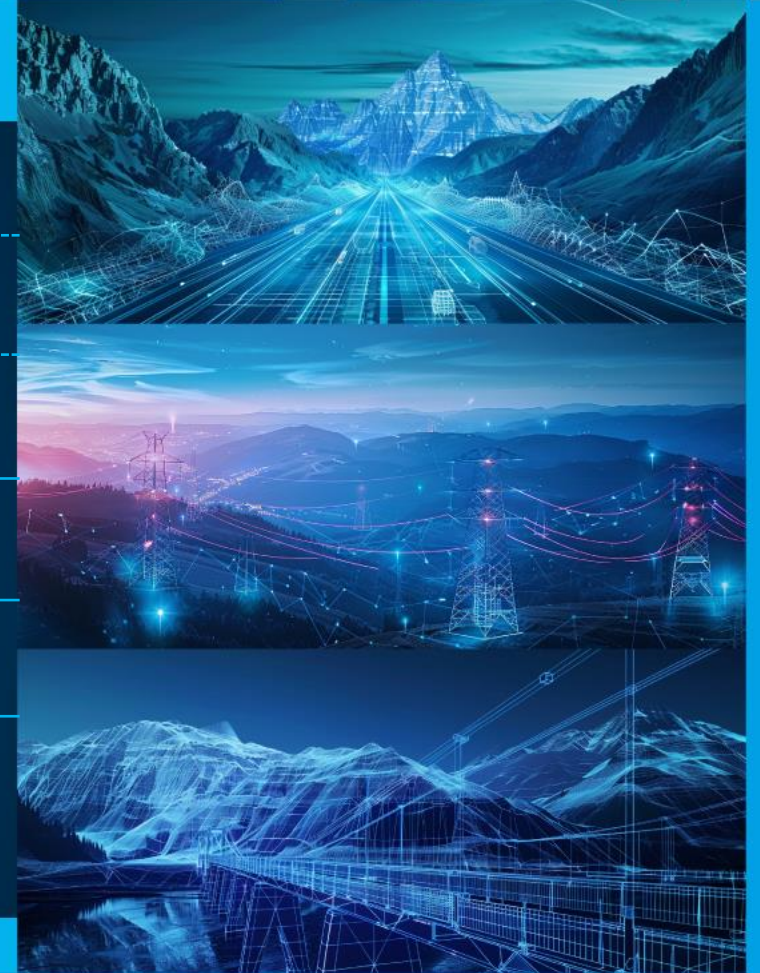




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PRIORITY PREPARATION ACTIVITIES OF THE KAMBARATA-1 PROJECT

Structure	Scope	Cost estimate (US\$ million)	Status
Road	Access road to site from 318th km of Bishkek-Osh highway to diversion tunnel (Cutoff No.2)	7,5	Construction
	Transport tunnel TT with outlet portal	7,2	Construction
	New access motor from diversion tunnel (Cutoff No. 2) to site	9,6	Design and cost estimating
Bridge	Bridge over Naryn River	12,7	Design and cost estimating
Power supply	OHL-110 kV (18 km) to the site of Kambarata 1 HPP and substation SS 110/35/10 kV	6,2	Construction
Construction facilities	Construction camp	2,6	Design and cost estimating
Other	Other site preparation works and contingency	4,2	
Total		50,0	



KAMBARATA-1 HPP: E&S CONSIDERATIONS

Parameters	Remarks
Land Acquisition	Minimum / no resettlement risks. The government will implement a comprehensive resettlement plan to mitigate the issue effectively
Impacts to cultural heritage	Historical and culturally significant artifacts are present within the area of Kambarata HPP-1. This is not a significant concern, as preparing a cultural heritage assessment and management plan will effectively address this issue
Impacts to important Biodiversity Areas	There are no nature reserves and other specially protected territories, as well as lands of the state forest found on the territory of Kambarata HPP-1. Construction of Kambarata 1 would have a limited impact on fish life, since the Naryn River is already blocked by five large dams of the Toktogul cascade, Kambarata 2 dam which has been in place since late 2009, and At-bashy HPP located further upstream on a tributary to Naryn River
Terrestrial and aquatic biodiversity	Risks associated with biodiversity are present. However, preparing a biodiversity management plan where listed species and critical habitats exist will effectively mitigate the issue
EIA / ESIA Status	The limited environmental and social impact studies undertaken in 2014 do not indicate any major detrimental impacts. An updated ESIA is in process



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PROJECT DEVELOPMENT HISTORY AND PROSPECTS

1988

Preparation of
Initial Design



2014

Preparation of
FS and ESIA by
SNC-Lavalin/ ENEX



2022

Confirmation of Kambarata-1 as the highest
priority and least cost project as part of **the
KR Energy Sector Master Plan**



2022

Government loan (KGS 1,555 billion) for the
implementation of the **Action Plan for the initial
period of construction of Kambarata-1**



2024-2030

**Attraction of investments (USD 4-5 billion)
and construction of Kambarata-1**



January 2024

**WB Kambarata-1 Sustainable
and Transformational Energy
Program (STEP) MPA initiated**



November 2023

**Approval of WB TA for
Kambarata-1 HPP
(US\$ 5 million)**



January 2023

**Roadmap among KR, UZ,
KZ on joint development
of Kambarata-1**



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Thanks for your attention!