International Energy Investment Forum

UNLOCKING THE INVESTMENT POTENTIAL FOR A GREENER FUTURE

Vienna, June 10-11, 2024

02 UPPER NARYN HPP CASCADE

UPPER NARYN HPP CASCADE: PROJECT OVERVIEW

CASCADE PROJECT PARAMETERS

Location
Naryn district, Naryn region

Potential Off-takers
China

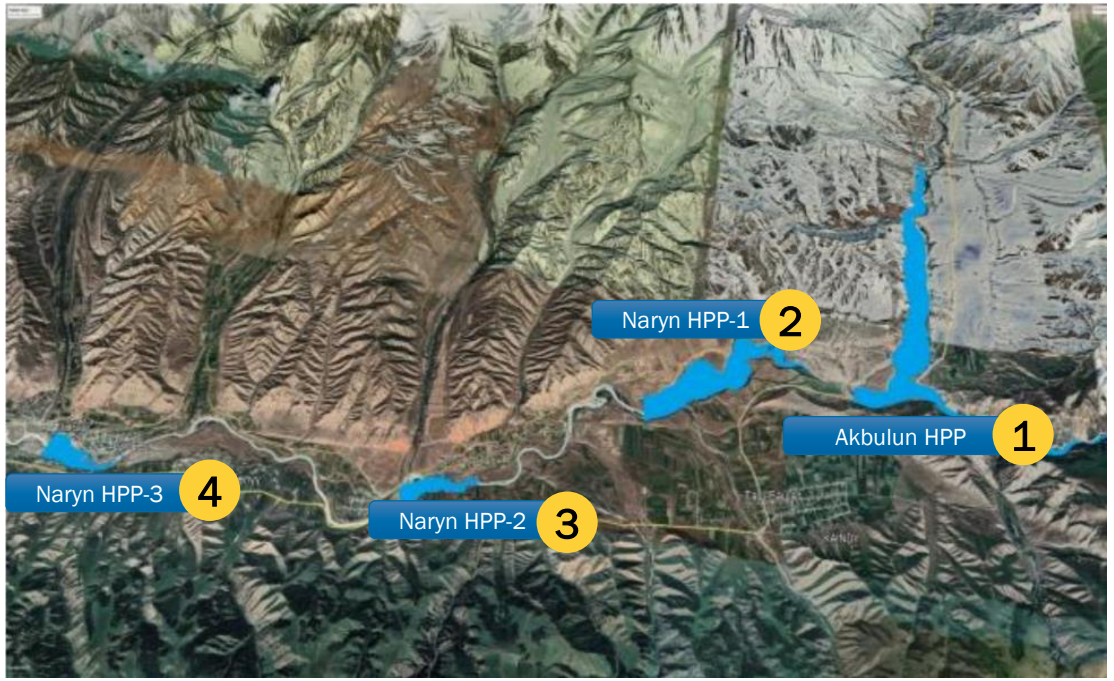
Capacity
237 MW

Annual Generation
942 GWh

Hydrology Data Available
1933-2013 (Naryn River)

Number of HPPs
4

PROJECT LOCATION



Feasibility study was conducted in 2013 for Akbulun and Naryn HPP-1 by Lengidroproekt

To be financed through PPP / Sovereign backed financing

To be connected to 220/110/35 kV Ak-Kyya substation via construction of 220 kV overhead line (~170 km)

Land for construction of the HPP cascade has been allocated

Sources: Internal Data

UPPER NARYN HPP CASCADE: PROJECT OVERVIEW

1

Akbulun HPP

- Mean Annual Flow: 75.1 m^3/s
- Dam Height: 75 m
- Reservoir Volume: 2.1 MN m^3
- Waterway Length: 2.3 km
- Design Head: 76.7 m
- Installed Capacity: 87.4 MW
- Energy: 345.5 GWh
- Capital Cost: USD 207 MN (2013 est.)
- Construction Period: 6 years

2

Naryn HPP-1

- Mean Annual Flow: 76.3 m^3/s
- Dam Height: 19.5 m
- Reservoir Volume: Not available
- Waterway Length: 6.8 km
- Design Head: 44.5 m
- Installed Capacity: 47.7 MW
- Energy: 187.5 GWh
- Capital Cost: USD 171 MN (2013 est.)
- Construction Period: 3 years

Sources: Internal Data

UPPER NARYN HPP CASCADE: PROJECT OVERVIEW

3

Naryn HPP-2

- Mean Annual Flow: 79 m^3/s
- Dam Height: 15 m
- Reservoir Volume: Not available
- Waterway Length: 5.8 km
- Design Head: 44.7 m
- Installed Capacity: 47.6 MW
- Energy: 188.8 GWh
- Capital Cost: USD 144 MN (2013 est.)
- Construction Period: 3 years

4

Naryn HPP-3

- Mean Annual Flow: 80.5 m^3/s
- Dam Height: 14 m
- Reservoir Volume: Not available
- Waterway Length: 8.3 km
- Design Head: 52.5 m
- Installed Capacity: 55 MW
- Energy: 220.5 GWh
- Capital Cost: USD 206 MN (2013 est.)
- Construction Period: 4 years

Sources: Internal Data

UPPER NARYN HPP CASCADE: E&S CONSIDERATIONS

Parameters	Remarks
Land Acquisition	Populated areas are minimally affected by reservoir flood zones, impacting only a few barns and sheds. The flood zone affects 296.5 hectares of agricultural land (mostly pasture). This is not a significant concern, as mitigation measures like land restoration, profit compensation, irrigation installation, cattle roads, & soil relocation will preserve vital agricultural resources.
Impacts to cultural heritage	Historical and cultural monuments are present in the reservoir zones. However, this can be mitigated through a cultural heritage assessment and management plan.
Impacts to important Biodiversity Areas	Preliminary assessment indicates Naryn State Reserve will not be affected by development of the Upper Naryn Cascade.
Terrestrial and aquatic biodiversity	Risk / Impact to be confirmed as part of ESIA process
EIA / ESIA Status	A preliminary E&S assessment is conducted through the concept document. Additionally, a full international level ESIA required along with appointment of E&S, and Dam Safety Panels of Experts

Sources: Internal Data

03 SUUSSAMYR-KOKOMEREN HPP CASCADE

SUUSSAMYR-KOKOMEREN HPP CASCADE: PROJECT OVERVIEW

CASCADE PROJECT PARAMETERS

Location
Chui region &
Jalal-Abad region

Potential Off-takers
China, Uzbekistan, Kazakhstan

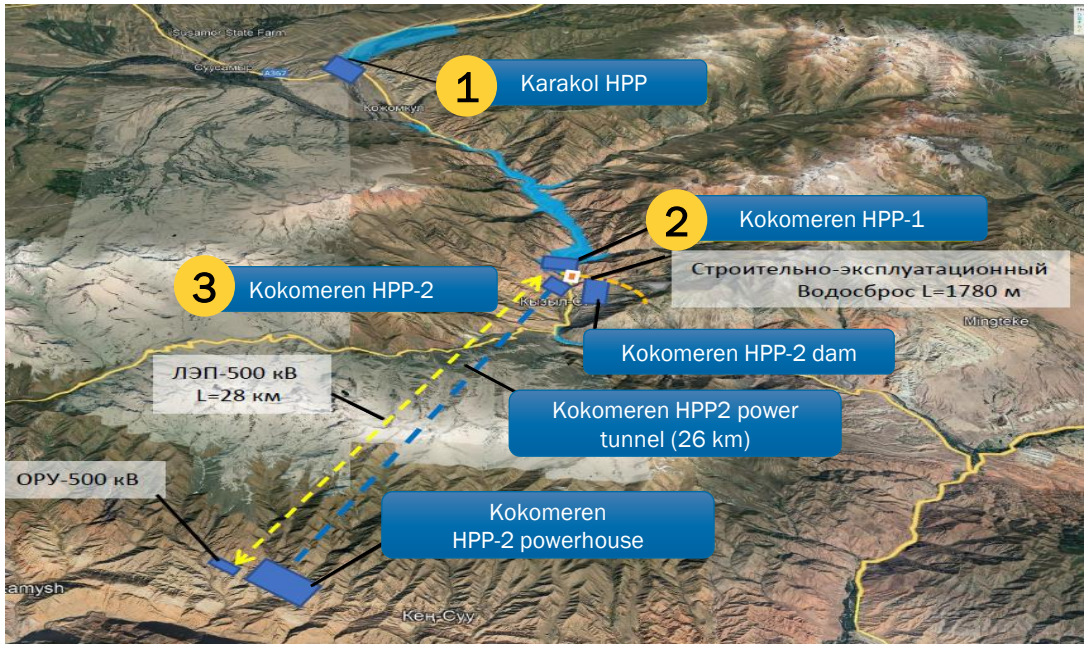
Capacity
1,305 MW

Annual Generation
3,318 GWh

Hydrology Data Available
1914-1999 (Kokomeren River)
1948-1999 (Jumgal River)

Number of HPPs
3

PROJECT LOCATION



Concept design was prepared for the cascade by Gidroproekt in 2024

To be financed through PPP / Sovereign backed financing

To be connected to 500 kV Datka-Kemin line via construction of 500 kV overhead line (~30 km); alternatively, to Bishkek substation via projected 500 kV overhead line.

Kokomeren River is the largest tributary of the Naryn River in terms of drainage area and water flow

Sources: Internal Data

SUUSSAMYR-KOKOMEREN HPP CASCADE: PROJECT OVERVIEW

1

Karakol HPP

- Mean Annual Flow: 21 m^3/s
- Dam Height: 99 m
- Reservoir Volume: 380 MN m^3
- Waterway Length: 0 km
- Design Head: 82 m (max)
- Installed Capacity: 33 MW
- Energy: 95 GWh
- Capital Cost: Not available
- Construction Period: Not available

2

Kokomeren HPP-1

- Mean Annual Flow: 62.4 m^3/s
- Dam Height: 230 m
- Reservoir Volume: 523 MN m^3
- Waterway Length: 0 km
- Design Head: 227 m (max)
- Installed Capacity: 360 MW
- Energy: 848 GWh
- Capital Cost: Not available
- Construction Period: Not available

Sources: Internal Data

SUUSSAMYR-KOKOMEREN HPP CASCADE: PROJECT OVERVIEW

3

Kokomeren HPP-2

- Mean Annual Flow: 65.2 m^3/s
- Dam Height: 41 m
- Reservoir Volume: 0.8 MN m^3
- Waterway Length: 26 km
- Design Head: 492 m (design)
- Installed Capacity: 912 MW
- Energy: 2,375 GWh
- Capital Cost: Not available
- Construction Period: Not available

Sources: Internal Data

SUUSSAMYR-KOKOMEREN HPP CASCADE: E&S CONSIDERATIONS

Parameters	Remarks
Land Acquisition	Minimal resettlement will be required (20 families, 125 people)
Impacts to cultural heritage	400 burial sites indicated for Kokomeren HPP-2. Risk / impact to be confirmed as part of ESIA process
Impacts to important Biodiversity Areas	Risk / Impact to be confirmed as part of ESIA process
Terrestrial and aquatic biodiversity	In the reservoir area there are no rare unique plants. However, for Kokomeren HPP-2, no work has been carried out to survey natural indicators on site. Hence, further assessment to be conducted as part of the ESIA
EIA / ESIA Status	ESIA required along with appointment of E&S, and Dam Safety Panels of Experts

Sources: Internal Data

04 CHATKAL HPP

CHATKAL HPP: PROJECT OVERVIEW

PROJECT PARAMETERS

Location
Chatkal district,
Jalal-Abad region

Potential Off-takers
Uzbekistan

Capacity
251 MW

Annual Generation
1,688 GWh

Hydrology Data Available
1915-1993 (Chatkal River)

Number of HPPs
1

PROJECT LOCATION

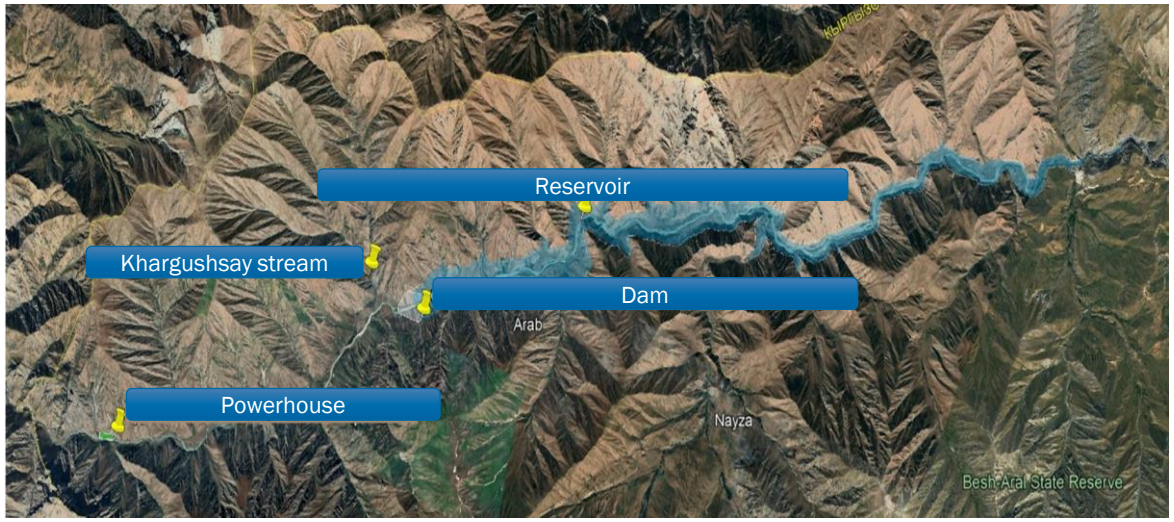
Concept design was prepared by Gidroproekt and National Academy of Sciences of the Kyrgyzstan in 2023

To be financed through PPP / Sovereign backed financing

To be connected to 110/35 kV Shekaftar substation via 110 kV overhead line (~70 km); alternatively, to UzHydroenergo power grid via 110 kV overhead line (~30 km)

Sources: Internal Data

CHATKAL HPP: PROJECT OVERVIEW



- Mean Annual Flow: 75.6 m^3/s
- Dam Height: 180 m
- Reservoir Volume: 559 MN m^3
- Waterway Length: 10 km
- Design Head: 288 m
- Installed Capacity: 251.4 MW
- Energy: 1,688 GWh
- Capital Cost: USD 376.5 MN (2022 est.)
- Construction Period: 5 years

Sources: Internal Data

CHATKAL HPP: E&S CONSIDERATIONS

Parameters	Remarks
Land Acquisition	The government evaluated multiple options and selected the one with minimal resettlement of the local community and the least impact on the biodiversity and ecology of the "Besh-Aral" State Nature Reserve (a UNESCO designated site).
Impacts to cultural heritage	Risk/Impact to be confirmed as part of ESIA process
Impacts to important Biodiversity Areas	Risk/Impact to be confirmed as part of ESIA process
Terrestrial and aquatic biodiversity	The Besh-Aral Nature Reserve contains most of the mountain flora and fauna of Central Asia, including numerous endemic species. Risk / impact to be confirmed as part of ESIA process.
EIA / ESIA Status	ESIA required along with appointment of E&S, and Dam Safety Panels of Experts

Sources: Internal Data

05 KAZARMAN HPP CASCADE

KAZARMAN HPP CASCADE: PROJECT OVERVIEW

CASCADE PROJECT PARAMETERS

Location
Toguz-Toro district,
Jalal-Abad region

Potential Off-takers
China, Uzbekistan, Kazakhstan

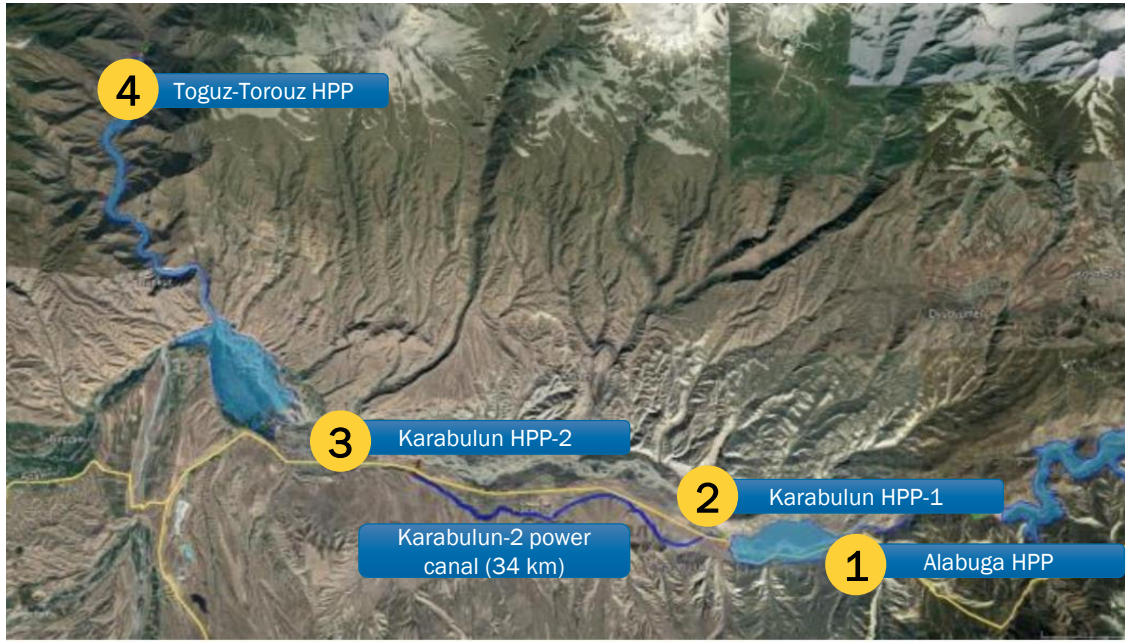
Capacity
1,160 MW

Annual Generation
4,661 GWh

Hydrology Data Available
1933-1999 (Naryn River)

Number of HPPs
4

PROJECT LOCATION



Concept design prepared by Gidroproekt in 2024

To be financed through PPP / Sovereign backed financing

To be connected to 500 kV Datka-Kemin line via construction of 500 kV overhead line (~150 km); alternatively, to be connected to 220/110/35 kV Ak-Kyya substation via construction of a 220 kV overhead line (~120 km)

Proximity of construction sites to external roads and Kambarata-1 HPP site enables cost-effective mobilization

Sources: Internal Data

KAZARMAN HPP CASCADE: PROJECT OVERVIEW

1

Alabuga HPP

- Mean Annual Flow: 182.6 m^3/s
- Dam Height: 235 m
- Reservoir Volume: 2,836 MN m^3
- Waterway Length: 0 km
- Design Head: 162m
- Installed Capacity: 600 MW
- Energy: 2,358 GWh
- Capital Cost: USD 1,140 MN (1990 est.)
- Construction Period: 9 years

2

Karabulun HPP-1

- Mean Annual Flow: 182.6 m^3/s
- Dam Height: 50 m
- Reservoir Volume: 110 MN m^3
- Waterway Length: 0 km
- Design Head: 40 m
- Installed Capacity: 149 MW
- Energy: 536 GWh
- Capital Cost: USD 253 MN (1990 est.)
- Construction Period: 7 years

Sources: Internal Data

KAZARMAN HPP CASCADE: PROJECT OVERVIEW

3

Karabulun HPP-2

- Mean Annual Flow: 182.6 m^3/s
- Dam Height: 50 m
- Reservoir Volume: 110 MN m^3
- Waterway Length: 14 km
- Design Head: 40 m
- Installed Capacity: 163 MW
- Energy: 852 GWh
- Capital Cost: USD 269 MN (1990 est.)
- Construction Period: 7 years

4

Toguz-Torouz HPP

- Mean Annual Flow: 200.3 m^3/s
- Dam Height: 80m
- Reservoir Volume: 169 MN m^3
- Waterway Length: 1.5 km
- Design Head: 62 m
- Installed Capacity: 248 MW
- Energy: 915 GWh
- Capital Cost: USD 422 MN (1990 est.)
- Construction Period: 8 years

Sources: Internal Data

KAZARMAN HPP CASCADE: E&S CONSIDERATIONS

Parameters	Remarks
Land Acquisition	Kazarman HPP cascade, situated in high-altitude areas, entails minimal land and pasture loss. There's no need to relocate existing facilities or build new social infrastructure.
Impacts to cultural heritage	Risk / Impact to be confirmed as part of ESIA process
Impacts to important Biodiversity Areas	Risk / Impact to be confirmed as part of ESIA process
Terrestrial and aquatic biodiversity	Risk / Impact to be confirmed as part of ESIA process
EIA / ESIA Status	ESIA required along with appointment of E&S, and Dam Safety Panels of Experts

Sources: Internal Data

06 SARY-JAZ HPP CASCADE

SARY-JAZ HPP CASCADE: PROJECT OVERVIEW

CASCADE PROJECT PARAMETERS

Location
Ak-Su district,
Isyk-Kul region

Potential Off-takers
China

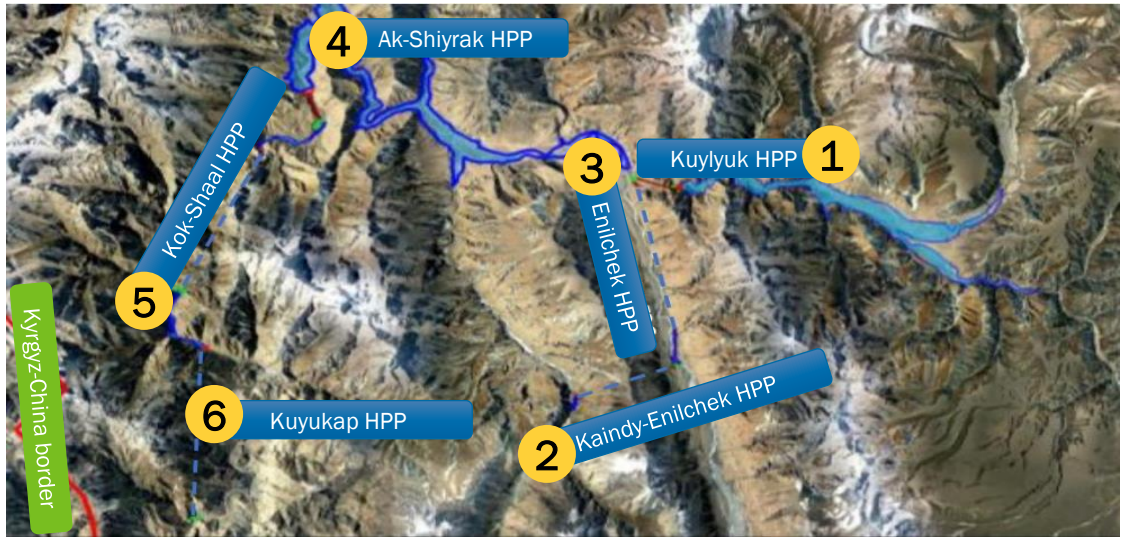
Capacity
1,100 MW

Annual Generation
4,764 GWh

Hydrology Data Available
1961-1994 (Sary-Jaz River)

Number of HPPs
6

PROJECT LOCATION



Concept design prepared by Gidroproekt in 2024

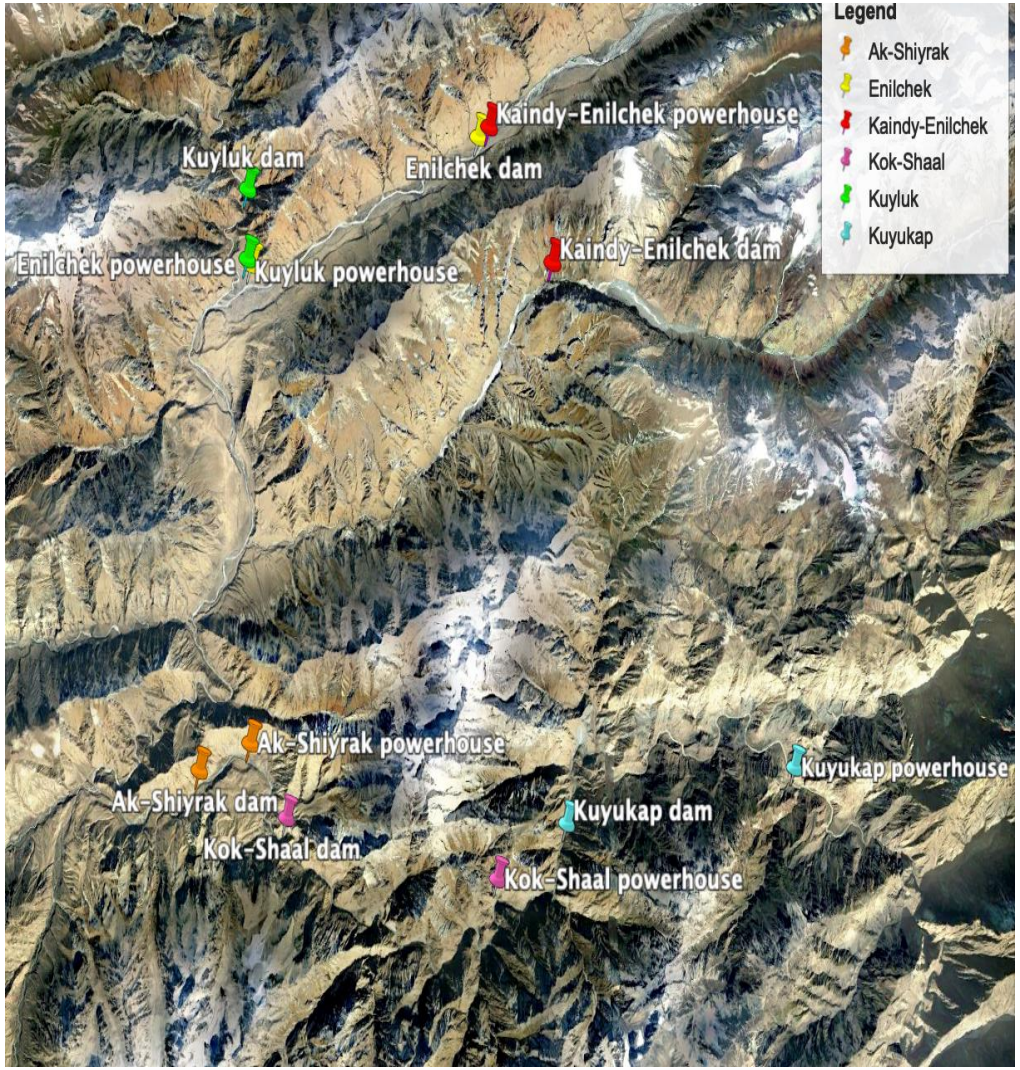
To be financed through PPP / Sovereign backed financing

To be connected to 110/10 kV Enilchek substation via 110 kV overhead line (~2 - 70 km); alternatively, to planned 220 kV Karakol substation via 220 kV Enilchek-Karakol overhead line (~150 km)

River Sary-Jaz is one of the largest mountain rivers in Central Tian - Shan and is transboundary with territory of China. Closest operated HPP to projected cascade is 900 MW Kumaryk HPP in China.

Sources: Internal Data

SARY-JAZ HPP CASCADE: PROJECT OVERVIEW



1 Kuylyuk HPP

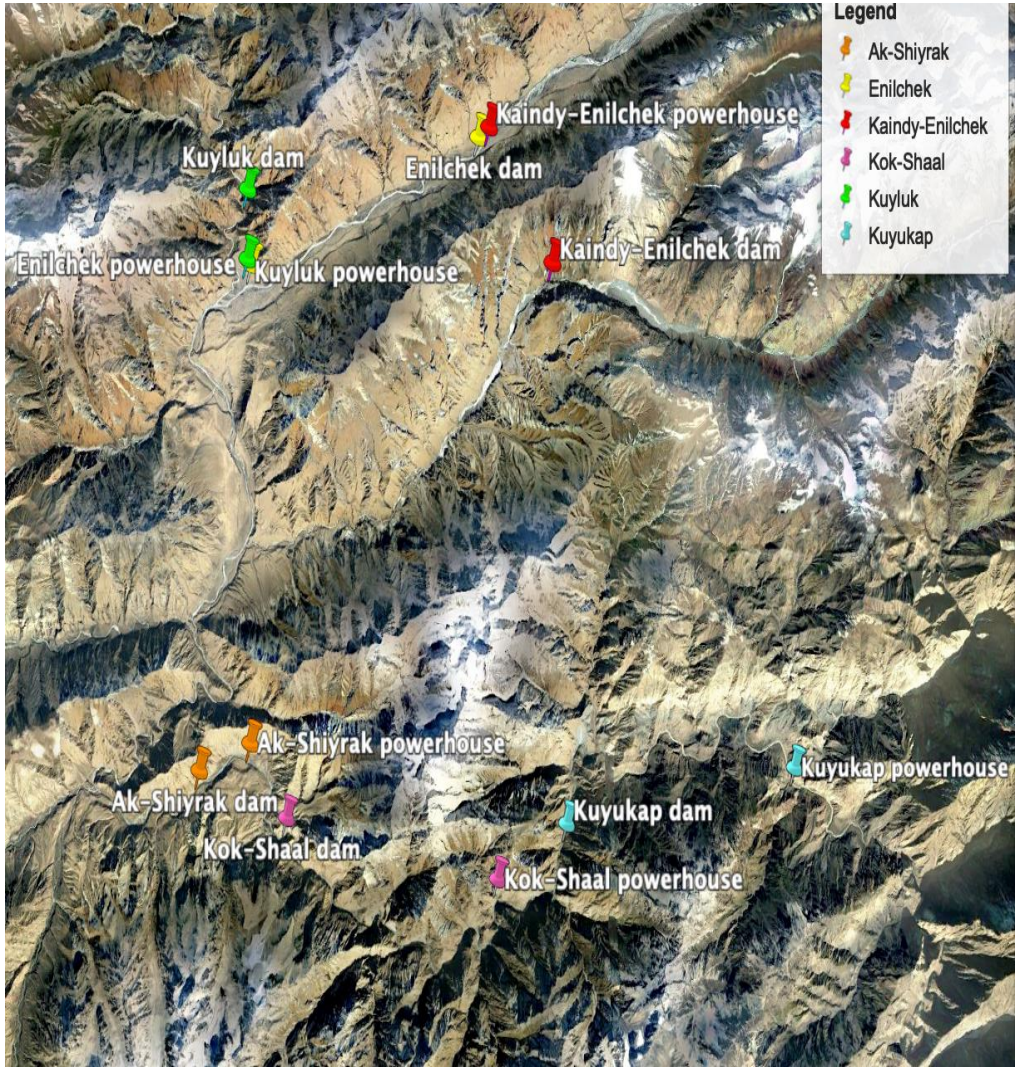
- Mean Annual Flow: 100 m^3/s
- Dam Height: 155 m
- Reservoir Volume: 650 MN m^3
- Waterway Length: 7.5 km
- Design Head: 190 m
- Installed Capacity: 170 MW
- Energy: 450 GWh
- Capital Cost: USD 325 MN (2017 est.)
- Construction Period: 7 years

2 Kaindy-Enilchek HPP

- Mean Annual Flow: 7.7 m^3/s
- Dam Height: 30m
- Reservoir Volume: 20 MN m^3
- Waterway Length: 7.5 km
- Design Head: 215 m
- Installed Capacity: 20 MW
- Energy: 80 GWh
- Capital Cost: USD 27 MN (2017 est.)
- Construction Period: 5 years

Sources: Internal Data

SARY-JAZ HPP CASCADE: PROJECT OVERVIEW



3 Enilchek HPP

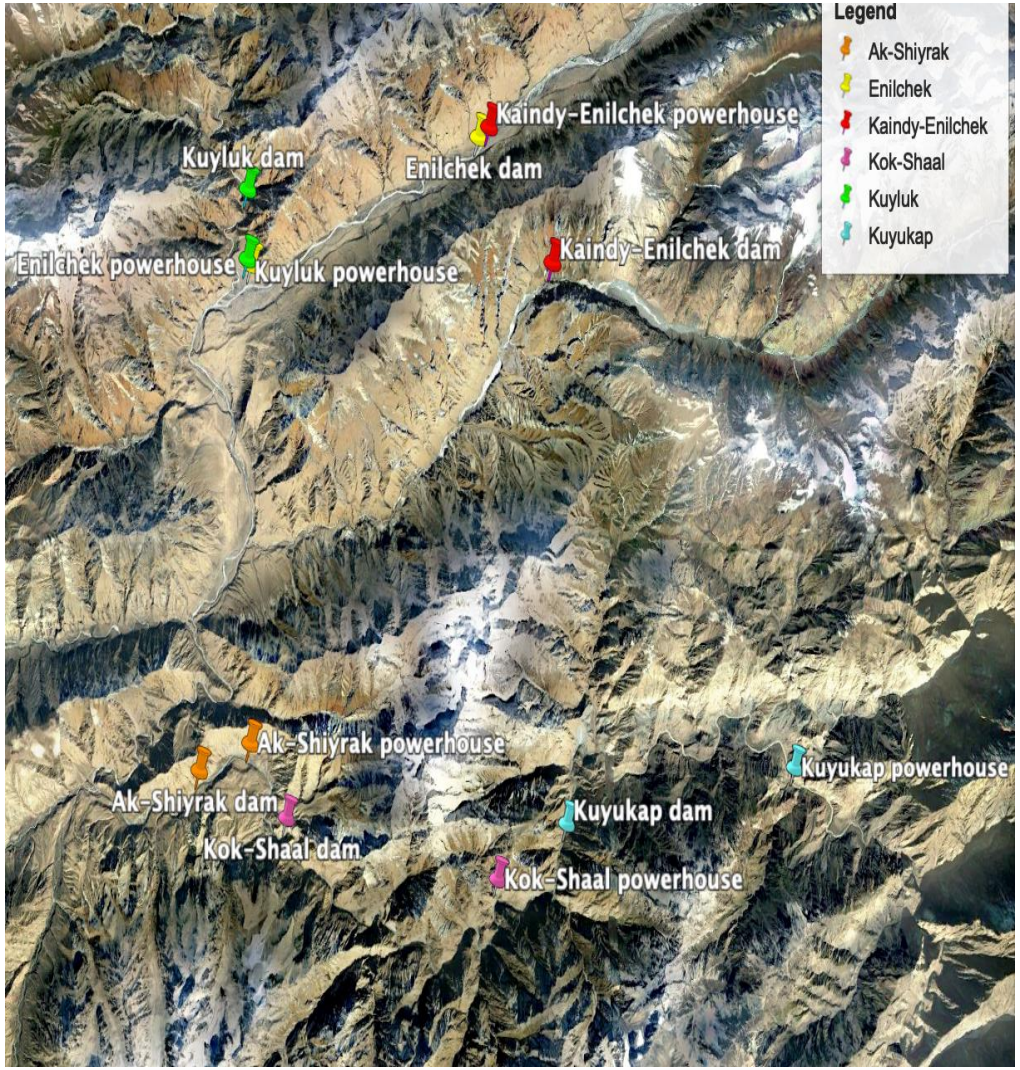
- Mean Annual Flow: 100 m^3/s
- Dam Height: 50 m
- Reservoir Volume: 9 MN m^3
- Waterway Length: 4 km
- Design Head: 84 m
- Installed Capacity: 60 MW
- Energy: 204 GWh
- Capital Cost: USD 85 MN (2017 est.)
- Construction Period: 6 years

4 Ak-Shiyrak HPP

- Mean Annual Flow: 100 m^3/s
- Dam Height: 120 m
- Reservoir Volume: 500 MN m^3
- Waterway Length: 8 km
- Design Head: 206 m
- Installed Capacity: 350 MW
- Energy: 1,230 GWh
- Capital Cost: USD 338 MN (2017 est.)
- Construction Period: 7 years

Sources: Internal Data

SARY-JAZ HPP CASCADE: PROJECT OVERVIEW



5 Kok-Shaal HPP

- Mean Annual Flow: 100 m^3/s
- Dam Height: 40 m
- Reservoir Volume: 10 MN m^3
- Waterway Length: 9 km
- Design Head: 190 m
- Installed Capacity: 250 MW
- Energy: 1,390 GWh
- Capital Cost: USD 348 MN (2017 est.)
- Construction Period: 7 years

6 Kuyukap HPP

- Mean Annual Flow: 100 m^3/s
- Dam Height: 30 m
- Reservoir Volume: 10 MN m^3
- Waterway Length: 11.5 km
- Design Head: 190 m
- Installed Capacity: 250 MW
- Energy: 1,410 GWh
- Capital Cost: USD 349 MN (2017 est.)
- Construction Period: 7 years

Sources: Internal Data

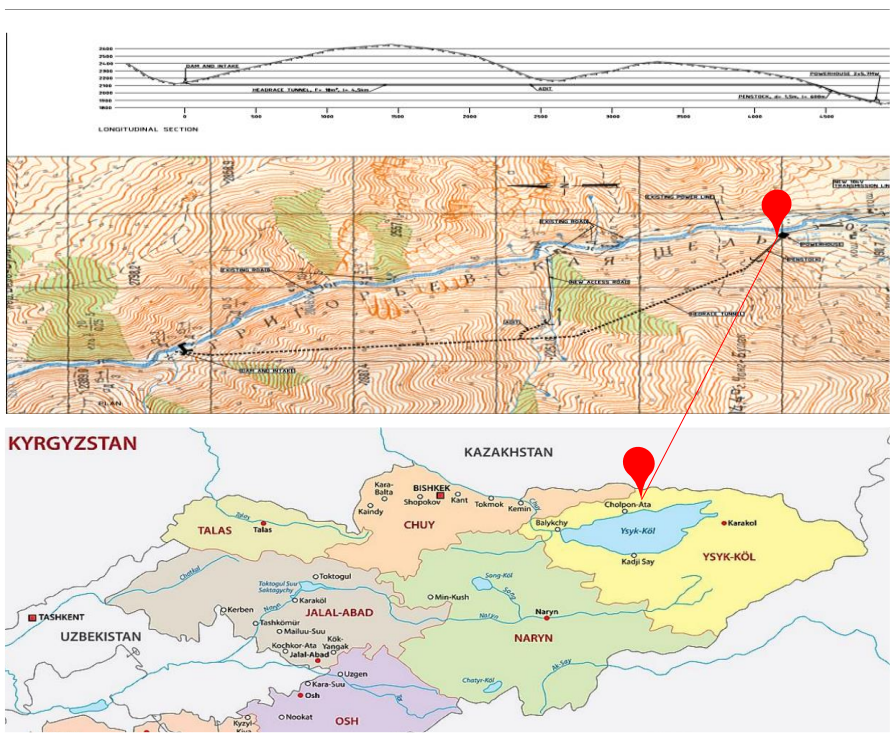
SARY-JAZ HPP CASCADE: E&S CONSIDERATIONS

Parameters	Remarks
Land Acquisition	Strategic project placement minimizes land disruptions, hence there is minimal risk of resettlement as the area is practically uninhabited
Impacts to cultural heritage	Petroglyphs are present in the Kul and Enilchek gorges of the Sary Zhaz valley. However, a Cultural Heritage Assessment and Cultural Heritage Management Plan (including a Chance Find Procedure) will be prepared to address the issue.
Impacts to important Biodiversity Areas	Sary Jaz area is part of Khan-Tengri National Park. Risk/Impact to be confirmed as part of ESIA Process
Terrestrial and aquatic biodiversity	Risk/Impact to be confirmed as part of ESIA Process
EIA / ESIA Status	ESIA required along with appointment of E&S, and Dam Safety Panels of Experts

Sources: Internal Data

07 SMALL HPPS

CHON-AK-SUU SHPP: PROJECT OVERVIEW



Location:
Isyk-Kul district, Isyk-Kul region

Installed Capacity:
11.4 MW (Offtake by KR NEGK)

Energy:
55.0 GWh

Aggregate Cost:
USD 31.2 MN (2007 est.)

Construction Period:
2 years

Hydrology Data:
1961-1990 (Chon-Ak-Suu River)

Study:
Feasibility Study conducted by Norconsult in 2007

Grid Connection:
To be connected to 110/10 kV Grigoryevka substation via construction of 10 kV overhead line, up to 4 km long + 10 kV step-up substation

Mean Annual Flow: **5.28 m^3/s**

Reservoir Volume: **Not available**

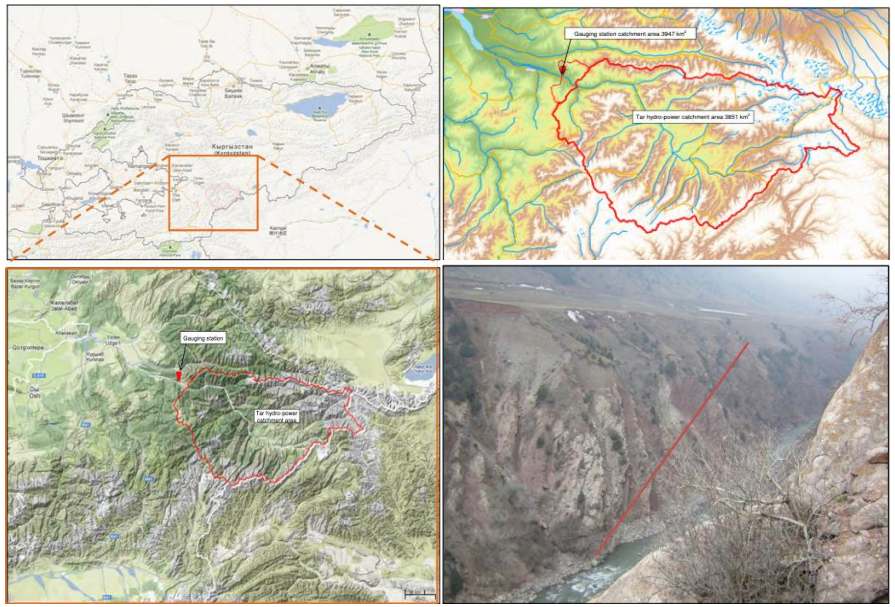
Design Head: **260 m**

Dam Height: **7.5 m**

Waterway Length: **5.3 km**

Sources: Internal Data

TAR-KAPCHYGAY HPP: PROJECT OVERVIEW



Location:
Kara-Kulja district, Osh region

Installed Capacity:
30 MW (Offtake by KR NEGK)

Energy:
121.5 GWh

Aggregate Cost:
USD 84.2 MN (2014 est.)

Construction Period:
2.5 years

Hydrology Data:
1939-2011 (Tar River)

Study:
Pre-Feasibility Study conducted by Norconsult in 2014

Grid Connection:
To be connected to 110/35/10 kV Kara-Kulzha substation via construction of 110 kV overhead line, 22 km long + 110 kV step-up substation

Mean Annual Flow: **100 m^3/s**

Reservoir Volume: **Not available**

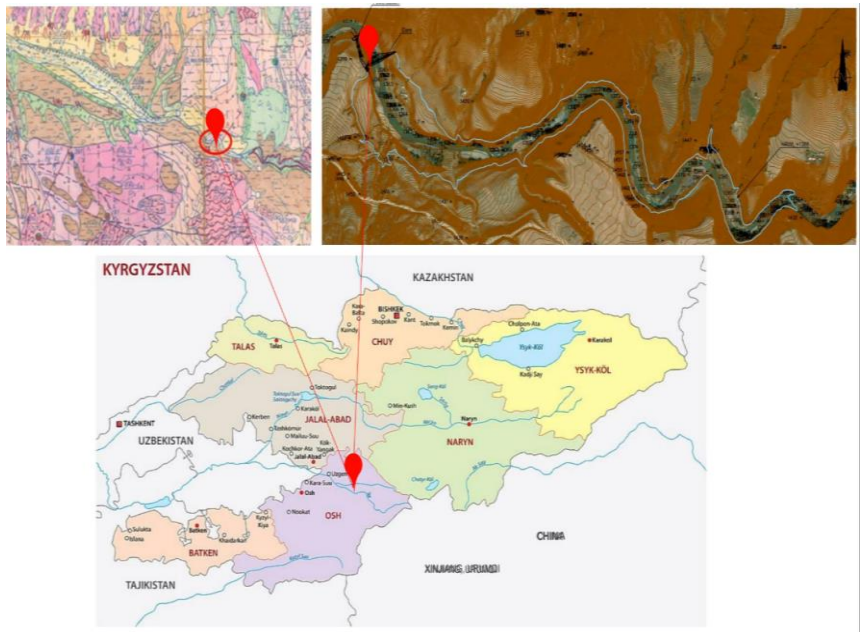
Design Head: **40 m**

Dam Height: **40 m**

Waterway Length: **0.25 km**

Sources: Internal Data

UPPER TAR HPP: PROJECT OVERVIEW



Location:
Kara-Kulja district, Osh region

Installed Capacity:
19 MW (Offtake by KR NEGK)

Energy:
80 GWh

Aggregate Cost:
USD 36 MN (2023 est.)

Construction Period:
2.5 years

Hydrology Data:
1989, 1990, 1995-20023, 2007-2021 (Tar River)

Study:
Pre-Feasibility Study conducted by Norconsult in 2023

Grid Connection:
To be connected to 110/35/10 kV Kara-Kulzha substation via construction of 110 kV overhead line, 20.5 km long + 110 kV step-up substation

Mean Annual Flow: **75 m^3/s**

Dam Height: **24 m**

Reservoir Volume: **0.45 MN m^3**

Waterway Length: **0.23 km**

Design Head: **27.5 m**

Sources: Internal Data

SMALL HPPS: E&S CONSIDERATIONS

Parameters	CHON-AK-SUU SHPP	TAR-KAPCHYGAY SHPP	UPPER TAR SHPP
Land Acquisition	Risk/Impact to be confirmed as part of ESIA process	There is some risk of resettlement, will have to mitigate by preparing a resettlement plan	Low Risk / Impact
Impacts to cultural heritage	Risk/Impact to be confirmed as part of ESIA process		
Impacts to important Biodiversity Areas	Risk/Impact to be confirmed as part of ESIA process	There are no protected or conservation worthy areas in the zone of influence of the proposed hydropower station.	Risk/Impact to be confirmed as part of ESIA process
Terrestrial and aquatic biodiversity	Risk/Impact to be confirmed as part of ESIA process		
EIA / ESIA Status	Given the relatively small size of the SHPP, and subject to confirmation of Risk/Impact Rating for this SHPP, an Overview Level ESIA is recommended	A full International ESIA required along with appointment of E&S, and Dam Safety Panels of Experts	A Preliminary E&S Assessment has been conducted with reference to the World Bank ESF

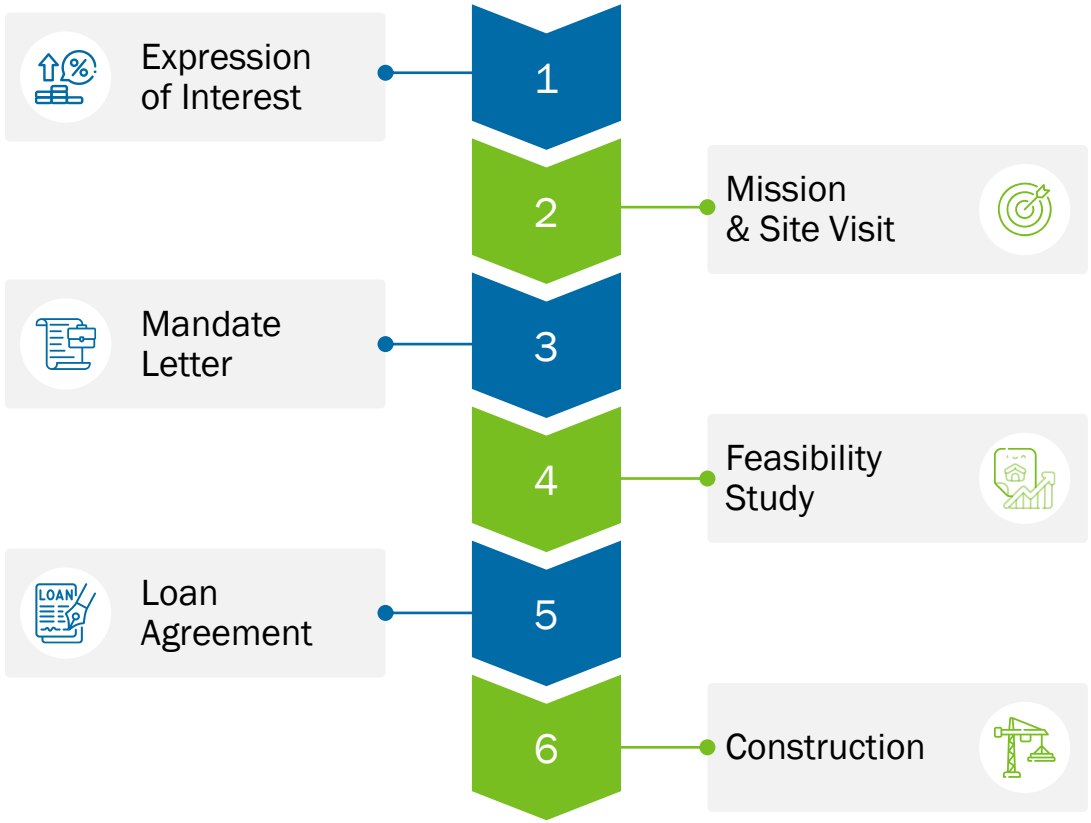
Sources: Internal Data

08 NEXT STEPS

NEXT STEPS – PROCESS FOR SOVEREIGN FINANCING

PROCESS & STEPS

This process is followed in case of sovereign financing of the IOP by the Kyrgyz Government.



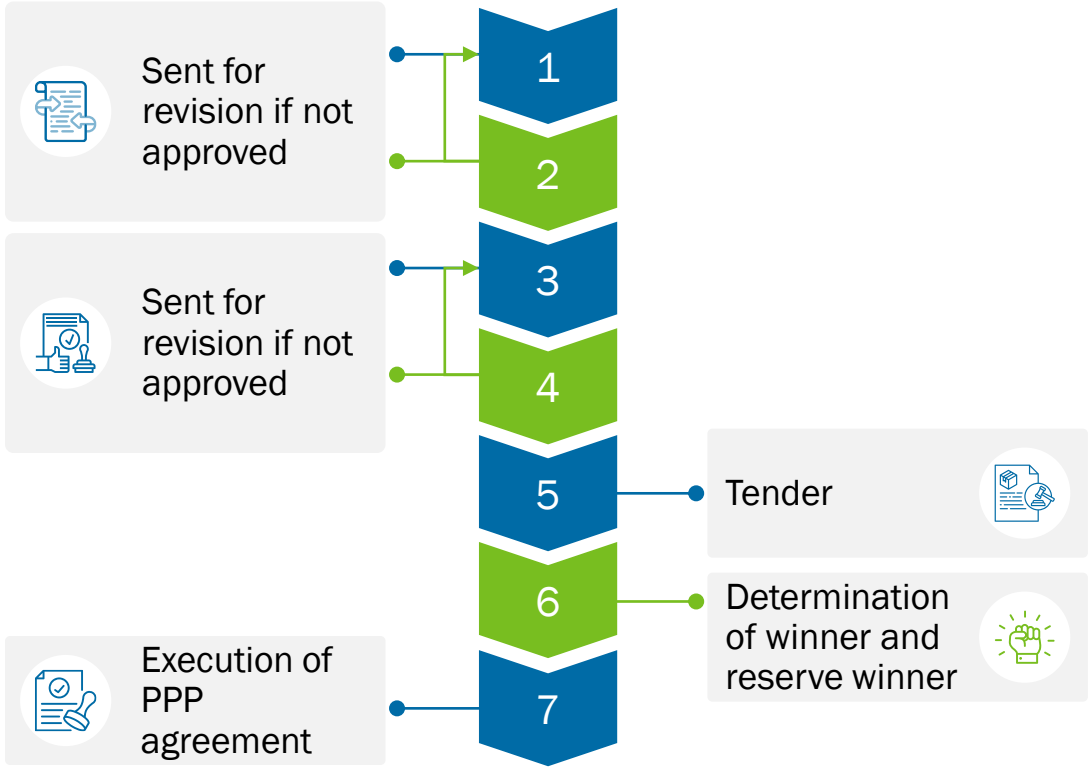
STEPS – SOVEREIGN FINANCING

1. Lender expresses its interest to finance presented Investment Opportunity (IOP) and prepares an official letter of interest addressed to the Ministries of Finance (MoF) and Energy of Kyrgyzstan (MoE).
2. Lender sends a mission to hold meetings with MoF, MoE and other relevant Government stakeholders and to arrange site visits.
3. If both parties find each other suitable for the IOP, a Mandate Letter with the main lending terms is executed between MoF and an interested Lender.
4. Parties jointly start developing the Feasibility Study and E&S Impact Assessment Study for the Project as well as the tender documents for procuring an EPC contractor.
5. Upon the approval of the Feasibility Report and the tender documents, Loan Agreement is signed between the Lender and the Government of Kyrgyzstan.
6. Upon signing and effectiveness of the Loan Agreement, selected EPC contractor commences the construction of the Project at the site.

NEXT STEPS – PPP TENDER PROCESS

PROCESS & STEPS

PPP tender route and its corresponding conditions and process are discussed below.
This process is recommended to be followed in case of multiple investor interest in the IOP.



STEPS – TENDER

1. Development of the Project Proposal by the Public Partner.
2. Sent for approval to the relevant Government authority.
3. Development of the PPP Tender Documentation (RFQ, RFP, Project Agreements).
4. Sent for approval to the relevant Government authority.
5. Announcement of a PPP tender with the issuance of a Request for Qualifications and the development of a short-list of pre-qualified bidders.
6. Issuance of a Request for Proposals and determination of the winner and reserve winner of the PPP tender.
7. Execution of PPP agreement. If the tender winner does not execute the PPP agreement, Tender Commission may decide to select the reserve winner as the winner of the tender.

Sources: Kyrgyzstan PPP Law