Kazakhstan Solar-Desalination Fund

Supporting Sustainable Energy and Water Access & Kazakhstan's Green Recovery

THE CHALLENGE

Kazakhstan currently faces threats posed by overreliance of fossil fuels and scarce water supply

Energy: Traditionally, Kazakhstan has relied heavily on fossil fuels; more than 80% of power production was generated by coal power plants. The threat of climate change, natural resource depletion, environmental degradation, and adverse health externalities on its citizenry will hamper its economic growth, thus making the structural transformation to renewable energy an urgent need that will support Kazakhstan's long term sustainable development.

Water: Over 3 million people's water demand, coming from Kyzylorda, Aktobe, Karaganda regions in Kazakhstan, currently depends on the Ertis river. Concerns about the river's water availability and stability warrant the need to develop proactive strategies, advanced technology, and financial tools to prevent a catastrophic water shortage. It is expected that water demand in Kazakhstan will significantly increase from 173 million m^3 to 350 million m^3 by 2040. Agriculture demand of water will soar as well. Water desalination, which is highly energy intensive, is identified as a critical pillar in resolving this looming water crisis.

OUR SOLUTION & INVESTMENT THESIS

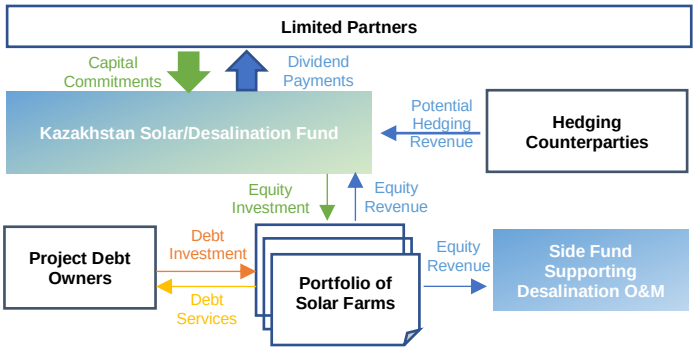
To address these two issues, we target the Caspian Sea, which provides a unique opportunity to implement floating solar farms with capacity up to 5GW. In addition to providing affordable clean energy to the rest of the country, the solar projects can mitigate the high energy cost hindering water desalination projects' scale-up. Effective and affordable desalination of saltwater from the Caspian Sea is instrumental in resolving the water crisis in Kazakhstan. Thus, we devised an integrated solution to address these sustainable development challenges.

Our fund will provide equity investment to a portfolio of floating solar farms on the Caspian Sea with a varied equity seniority structure. The solar projects will provide clean and affordable energy to the desalination plants and the rest of Kazakhstan. Moreover, a side fund will be established to subsidize the O&M cost of the desalination plants.

As an incentive for LPs to invest in this frontier infrastructure fund with social impact, 20% of the equity revenue will be paid senior to project debt at 10% guaranteed IRR. An additional 2% equity return senior to debt will be paid to a side fund supporting the O&M of the desalination plant. We target 12% return on the remaining 80% of their commitment junior equity payout. The fund will use option-based hedging instruments at the fund level to address the currency risk issue.

Our project debt partners will be MDBs, such as the EBRD and AIIB, who will be receptive to the varied equity structure to promote SDGs and mobilize private capital in Central Asia.

Fund Structure:

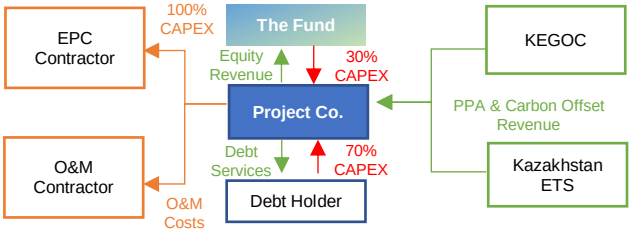


KEY FUND INFORMATION

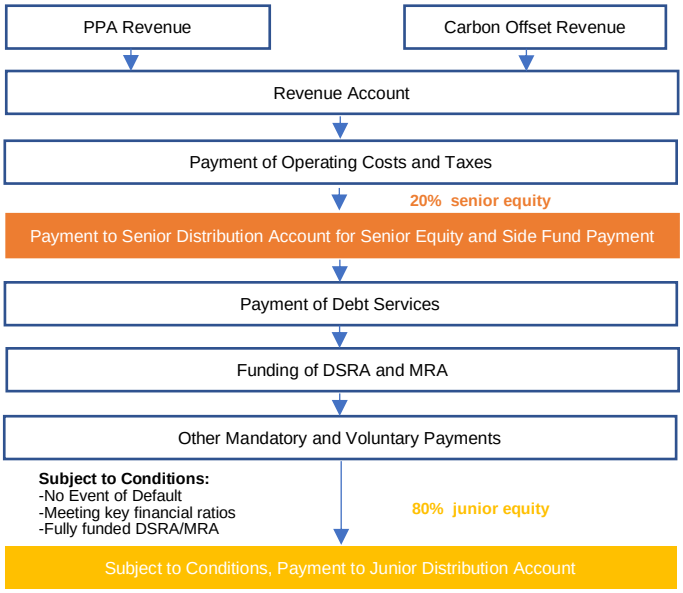
Fund Type	Infrastructure Private Equity Fund
Fund Size	Targeted US$200M
Fund Life	15 Years with option to extend up to 30Y
Asset Class	Equity in solar farms with varied seniority
Asset Revenue	-Fixed tariff PPAs with KEGOC, the government owned utility company -Carbon offset credits
Target IRR for 15Y (Hedged USD Return)	-Guaranteed 10% for portion senior to project debt (additional 2% to a side fund supporting desalination O&M) -Target 12% for portion junior to project debt
Fee Structure	-1% Management Fee -15% Incentive Fee (with 10% hurdle rate on blended equity return)
Investment Criteria / Project Leverage Ratio	-Solar projects with 15Y fixed tariff PPA from KEGOC; project lifespan up to 30Y -Project that is certified to generate carbon offsets in the Kazakhstan Emission Trading System -Project with strategic debt investors consist of multilateral development banks receptive to the varied equity seniority structure -Debt/equity ratio not lower than 70/30; debt will be DSCR sculpted
Location	Caspian Sea, Kazakhstan
Investor Pool	Pension Fund, Infrastructure Fund of Funds, Impact Investment Fund, Life Insurance

PROJECT FINANCE STRUCTURE & CASH WATERFALL

Project Finance Structure:



Cash Waterfall Illustrating Varied Equity Seniority:



DUE DILIGENCE

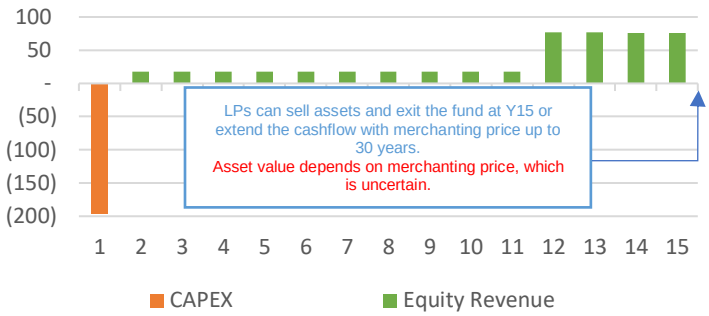
Commercial Due Diligence	Conduct onsite visit and interview. Liaise with KEGOC on PPA signing conditions. Engage with potential buyer of carbon offset certificates.
Legal Due Diligence	Hire third-party as legal advisor to conduct project legal due diligence, including but not limit to Credit Agreement and Power Purchase Agreement.
Financial Due Diligence	Hire third-party as independent financial advisor to evaluate financial feasibility and financing structure.
Technology Due Diligence	Hire competent technical advisor to produce independent Energy Production report and Site Suitability report.

RISK FACTORS & MITIGATION

Risk	Risk Rating	Risk Mitigation
Regulatory & Policy Risk	Low	-Perform scenario test with various policies -Utilize Political Risk Guarantee from ECAs
Power Market Risk	Low	-Ensure the bankability of the PPAs
Operation Risk	Moderate	-Pass risk to O&M Contractor thru performance guarantee
Revenue Risk	Moderate	-Include Take-or-Pay clause in PPAs -Monitor power offtaker's credit condition -Utilize option-based hedging strategy -Fund focuses on PPA period with option extending to merchanting period up to 30Y
Financing Risk	High	-Work closely with financial advisor and debt partners to ensure better sourcing of funding at the early stage

ILLUSTRATIVE RETURN ANALYSIS

Equity Cashflow (15Y P50 Scenario in US$ Million):



Key Assumptions:

1. 15Y Feed-in-Tariff at 35KTZ per KWh
2. Currency risk hedged at 15% downside
3. 0.25% capacity decay per year
4. Project debt fully repaid by Y10
5. Assuming P50 scenario net capacity factor of 25%; total nameplate capacity of 450MW
6. Debt sculpted with 1.3x DSCR ratio

SOCIAL IMPACT

SDGs

Quantitative Measurement (15Y Project, P50 Scenario)

Clean Electricity Generated	13,575 GWh
CO2 Emission Reduced	5.2 Million Tons
Subsidized Desalinized Water	97 Million M^3
Impacted Population	6 Million

POLICY SUPPORT & SCALABILITY

Kazakhstan "National Concept for Transition to a Green Economy up to 2050" with Multilateral Development Bank Support

This strategic plan's objective is to bring the share of renewable energy in electricity generation from zero to 3 per cent by 2020, and then to raise it further to 30 per cent by 2030 and 50 per cent by 2050. EBRD, ADB, AIIB are actively providing funding to renewable infrastructures in Kazakhstan.

Scale-Up to 5GW by 2030 & Beyond Kazakhstan

We expect the project can be scale up to 5GW nameplate capacity by 2030 to utilize the full solar capacity of the Caspian Sea. Moreover, this financing model can be replicated in countries with the dual need of clean energy and water desalination, such as Turkmenistan, Israel, and Saudi Arabia.

INNOVATION ELEMENTS

The project aims to capitalize on the advantageous condition offered by the Caspian Sea. Given the proximity of the floating solar farms and the desalination plants, power loss due to transmission with be minimized, thus increasing energy efficiency and lowering the cost of desalination. Our side fund will provide support to the O&M of the desalination, further lowering the cost of desalinized water.

Our fund is able to provide investor incentives and long-run stable IRR with a varied equity seniority structure. We expect the fund to galvanize private capital investments in the country's renewable infrastructures, enhancing Kazakhstan's green recovery effort.