May 2014

The Prospects of Investment in the sector of Hydropower & Drinking Water in Nepal

Contents

1. K-water's ongoing hydropower project

Project Summary

Location : Kaski District of Gandaki Zone, 170 km West of Kathmandu

Type : Run-of-River (Cascade development)

Installed Capacity : 62.6 MW (Annual Gen. : 310.4 GWh , Plant Factor : 56.6%)

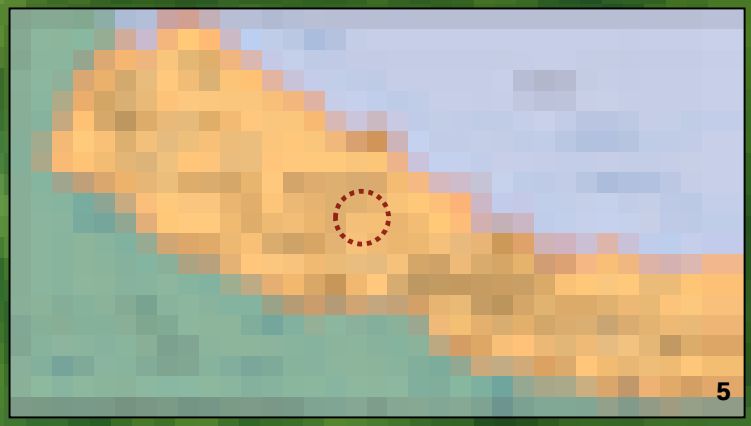
Total Cost : 154 million USD

Duration : Construction 4 years, O&M 31 years (BOOT basis)

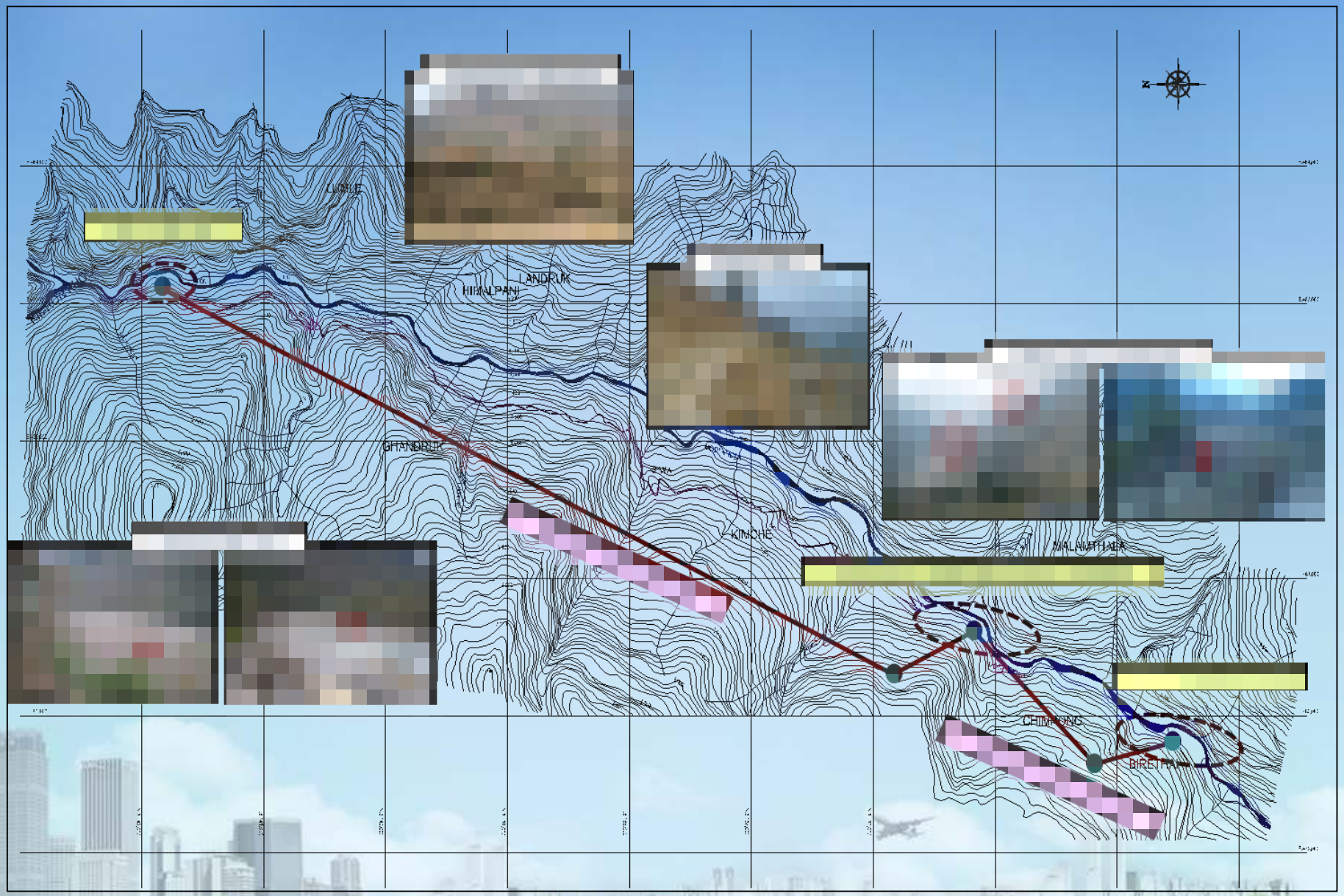
Items	Upper Modi A HEP	Upper Modi HEP
Installed Capacity	42.6 MW	20 MW
Average Annual Generation	215.6 GWh	94.8 GWh
Plant Factor	57%	54.1%
Headrace Tunnel Length	7 km (D 3.4~4.0 m)	3 km (D 3.4~4.0 m)
Construction Duration	4 yrs	2~2.5 yrs

1.1. Project Location

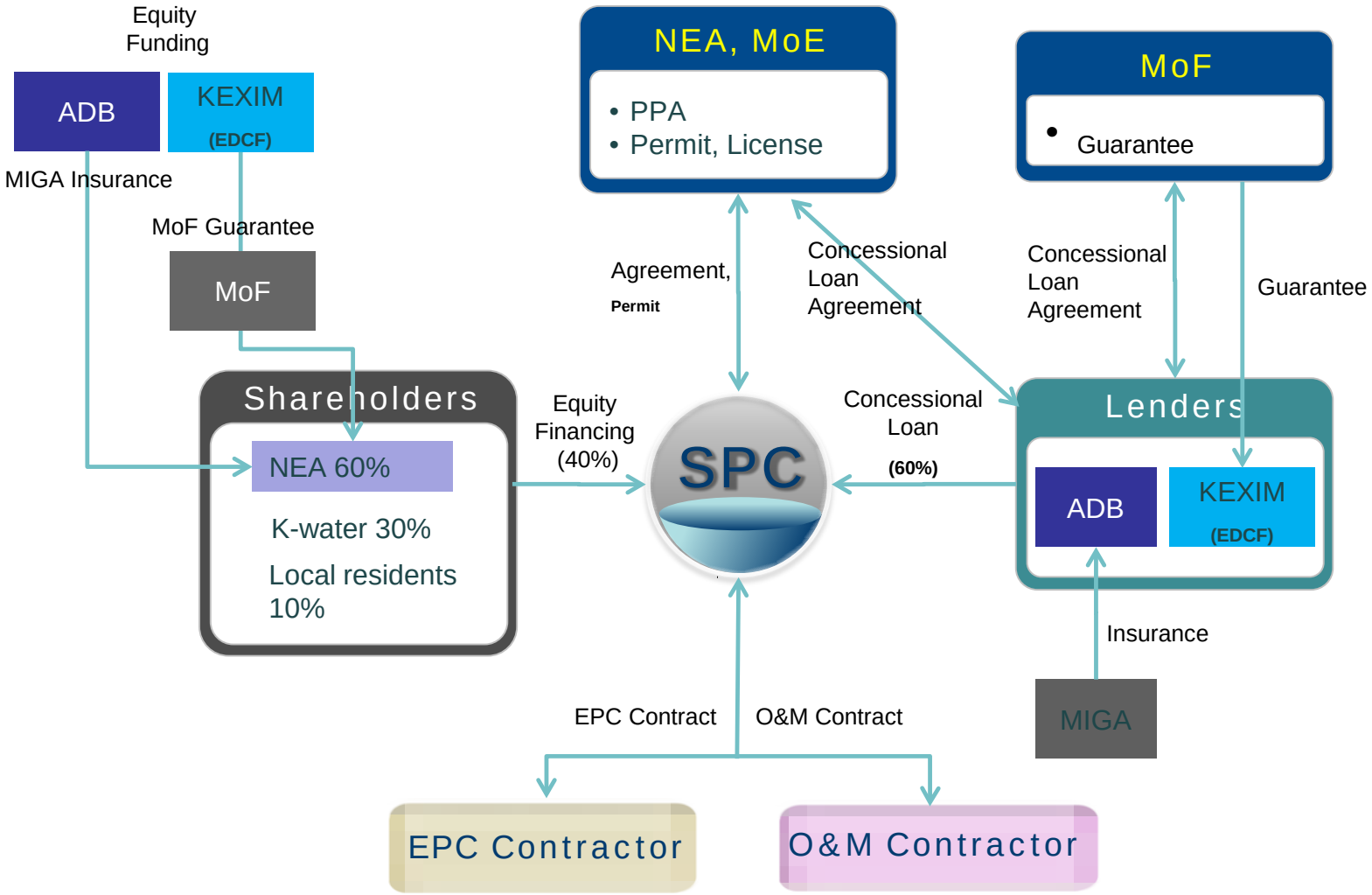
1.2. Site View



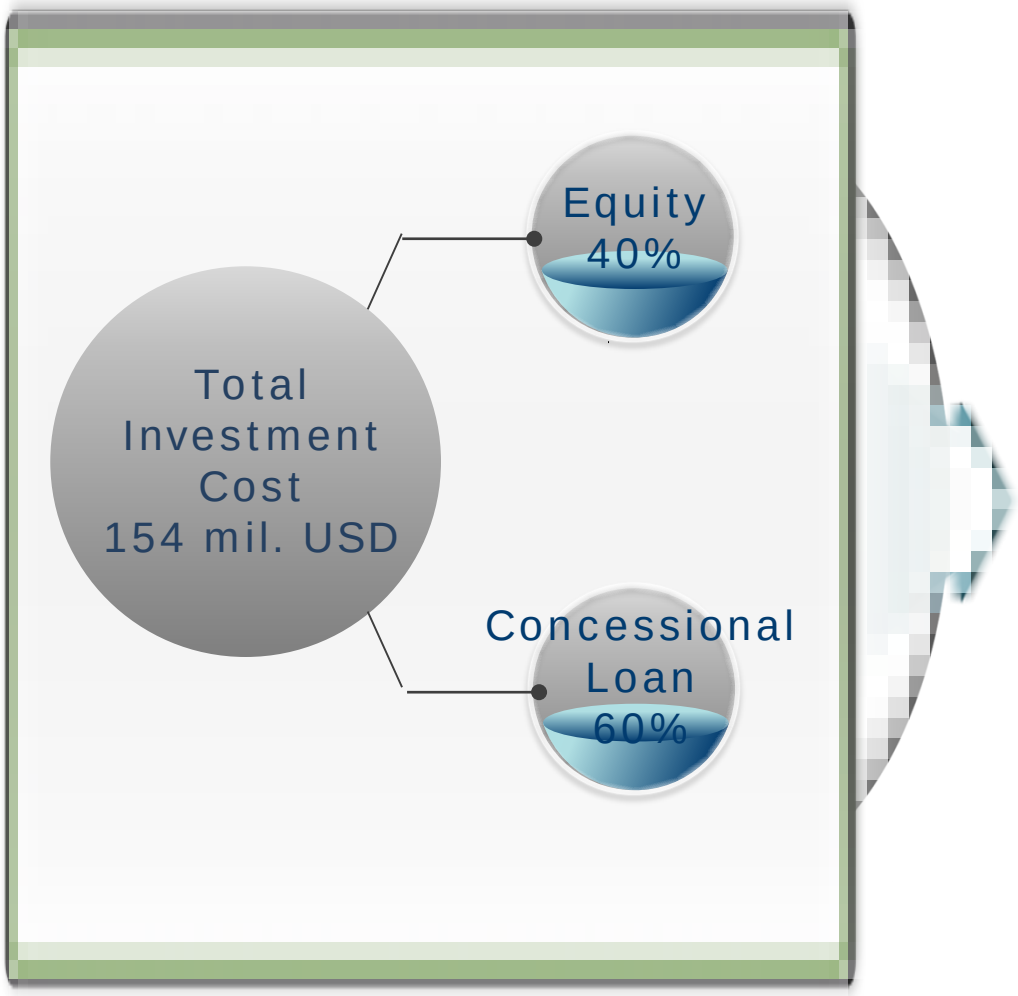
1.3. Site Map


LUKLE
HIMALPANI
LANDRUK
GHANDRUK
KIMCHE
CHIMPUNG
BIRETHA

1.4. Project Structure



1.5. Financing Plan



Equity Financing

- The shareholder ratio was tentatively agreed : NEA (60%), K-water (30%), Local residents (10%).

Debt Financing

The following banks are considered as potential lenders:

- Korea Exim Bank (EDCF)
- Asian Development Bank (Concessional Loan)

1.6. Project Milestones

Procedures	Schedule	Counterpart
MOU for Joint Development	June 2011	NEA
Joint Development Agreement	March 2012	NEA
Update of Feasibilities Studies	May 2014	NEA
Update of EIA	July 2014	
Loan Request	July 2014	Lenders
Initiation and Establishment of SPC	June 2014	NEA
Concessional Loan Processing and Finalization	March 2015	Lenders
PPA Draft	September 2014	NEA
EPC Contract	April 2015	EPC Contractor
Commencement of Construction	March 2015	

2. About K-water

Establishment & Vision

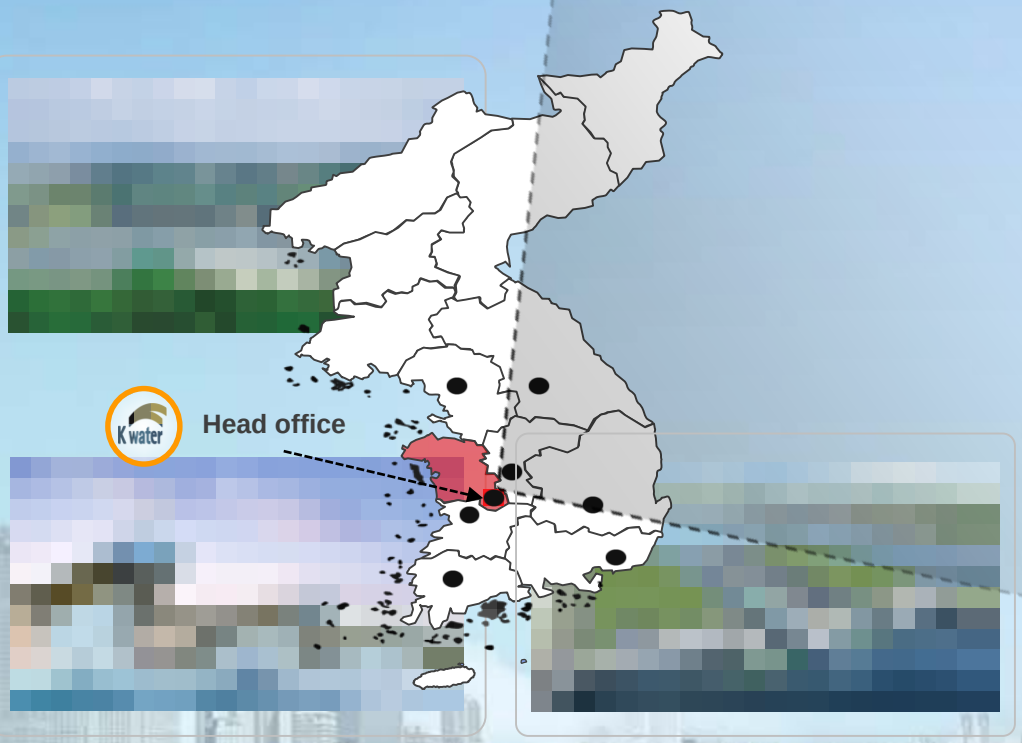
established in 1967

To become one of the leading water resources companies in the world

Key Roles and Objectives

Key implementation arm of the Korean Government

- Develop & manage water resources
- Improve water quality
- Carry out flood control measures

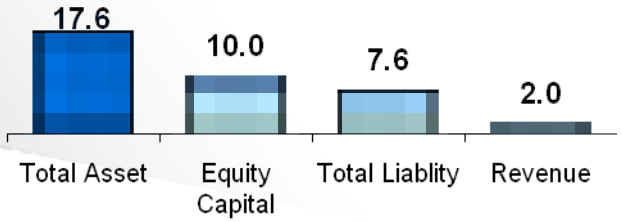


Organization

- Divisions : 13
- Departments : 58
- Employees : 4,072

'10 Financial Summary

Unit: bn. USD
1 USD=1,049.43 KRW(July 28, 2011)



2.1. Financial Highlight

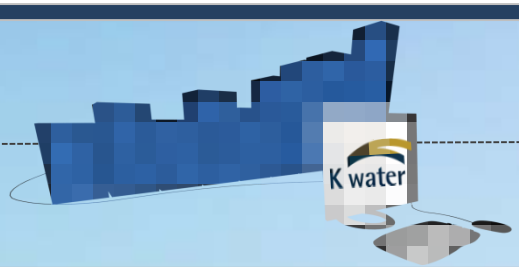
Full Government Support

- 100% Government Ownership
- Sovereign Equal Rating : A1/A

STANDARD &POOR'S Moody's

Pivotal Policy Role

- Importance of Water Resources Highlighted
- Sole Public Entity for Many Water-Related Business
- Practically No Privatization Risk



Investment Highlights

Key Government Project

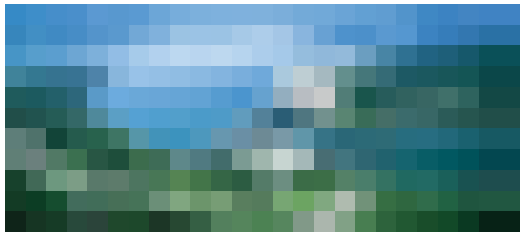
- Four Rivers Restoration Project
- Gyeong-In Canal Project
- Engaged in other ongoing Major Projects nationwide

Solid Financial Profile

- Sound Capital Structure
  Debt/Capitalization : 40.1%
- Solid Cash Flow
  Operating Margin Ratio 10.7%

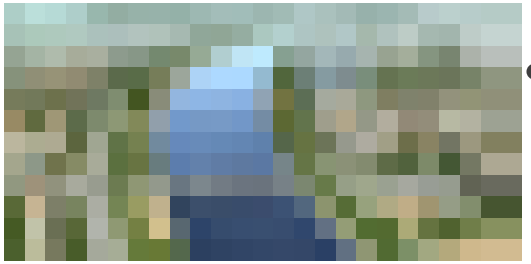
2.2. Business Overview

Water Resources

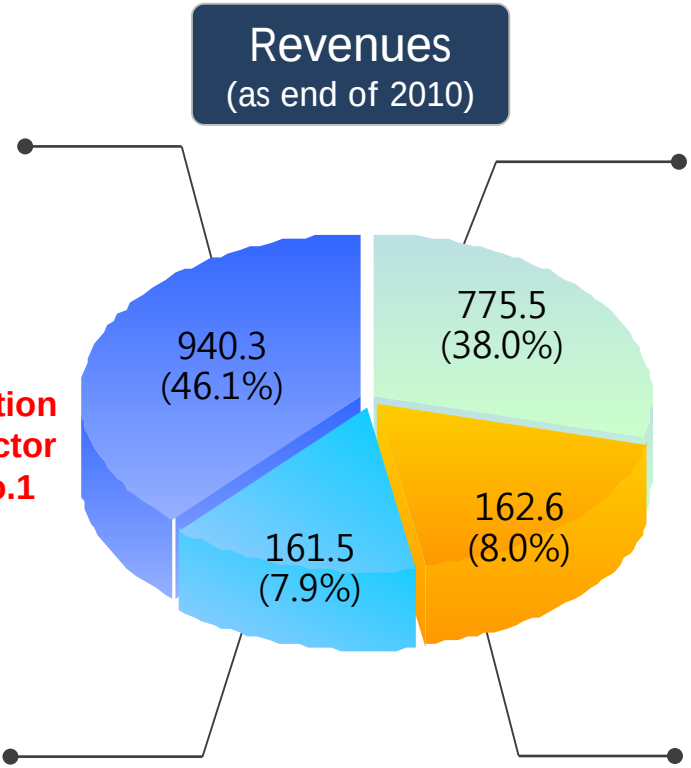


- Construction and Management of Multi-Purpose Dams
- **Hydro-electric Power Generation**
  - The Market Share of the sector in Korea : 32%/ Ranked No.1
- 4-River Restoration Project

Site development



- Development of Industrial Complexes
- Development of Special Areas

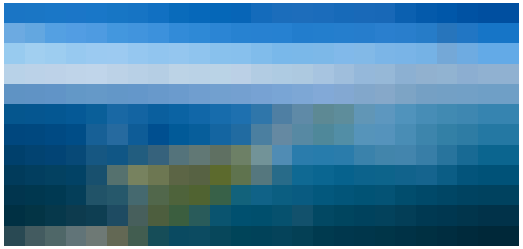


In mil. USD/ 1 USD = 1,049.43 KRW

Water supply

- Multi-Regional waterworks
- Industrial Waterworks
- Serving 25 mil. people

Others



- Alternative Energy Business
- Local waterworks
- Waste water treatment
- Overseas business
- Gyeong-In Canal Project

2.3 Operation Overview

Water Resources Management

- Managing 16 multi-purpose dams
  - Flood control (2.2 bill. m3)
  - Water supply (10.9 bill. m3/yr)
  - Hydro-power generation (1,300 MW)
- Managing 16 water supply dams
  - Water supply (1.4 bill. m3/yr)
- 5 new dams under construction 21 existing dams under rehabilitation

Water Supply Management

- Managing 33 multi-regional water supply systems
  - Capacity : 17 Billion Litre/day
  - Intake facility : 24 units
  - WTP : 40 units
  - Pumping station : 76 units
  - Pipe line : 4,800km

※ app. 50 % market share in Korea

- Managing 18 Local water supply systems by “Concession Agreement”

Wastewater Management

- Managing 112 wastewater treatment plants
- Construction of Integrated management system
- Participating in Public-Private Partnership projects

2.4 K-water's Overseas Business

Field and Current State

- **Overall project organization and management including equity investment**
- **Feasibility study, Detailed design and construction supervision**
- **Technical assistance to improve the management level**

- **Completed 30 projects in 18 countries (China, Laos, Vietnam, etc)**
- **11 on-going projects in 10 countries (Pakistan, China, Indonesia, Philippines, etc)**

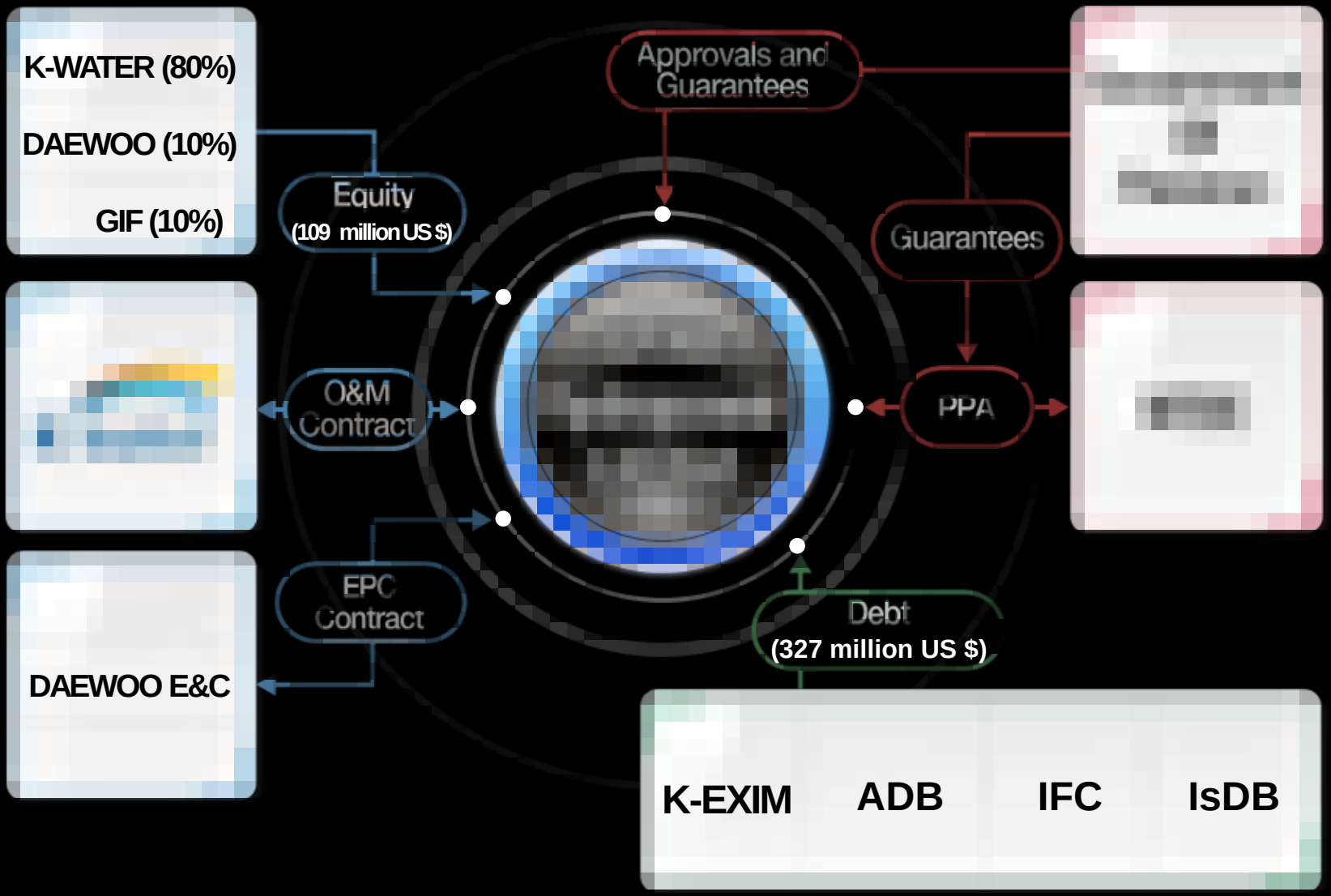
2.5 Pakistan Patrind HEP

Overview

Outline

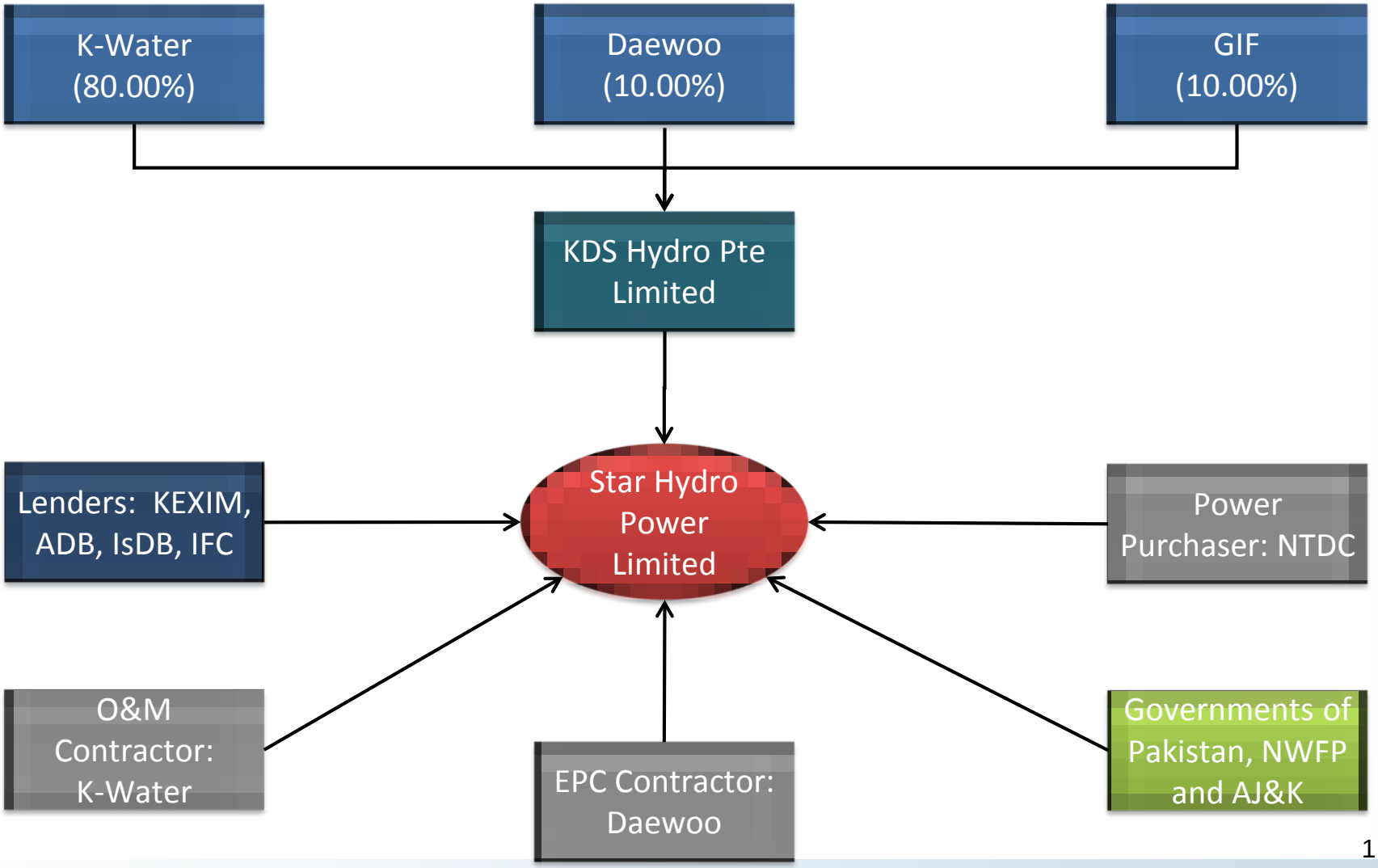
- Total Cost : 436 million USD
- Generation Capacity : 147MW
- Type : Run of River
- Concession Periods : 30yr (BOT)
- Commercial Operation Date : 2016

Project Structure



2.6 Pakistan Patrind HEP

Key Stakeholder of SPC

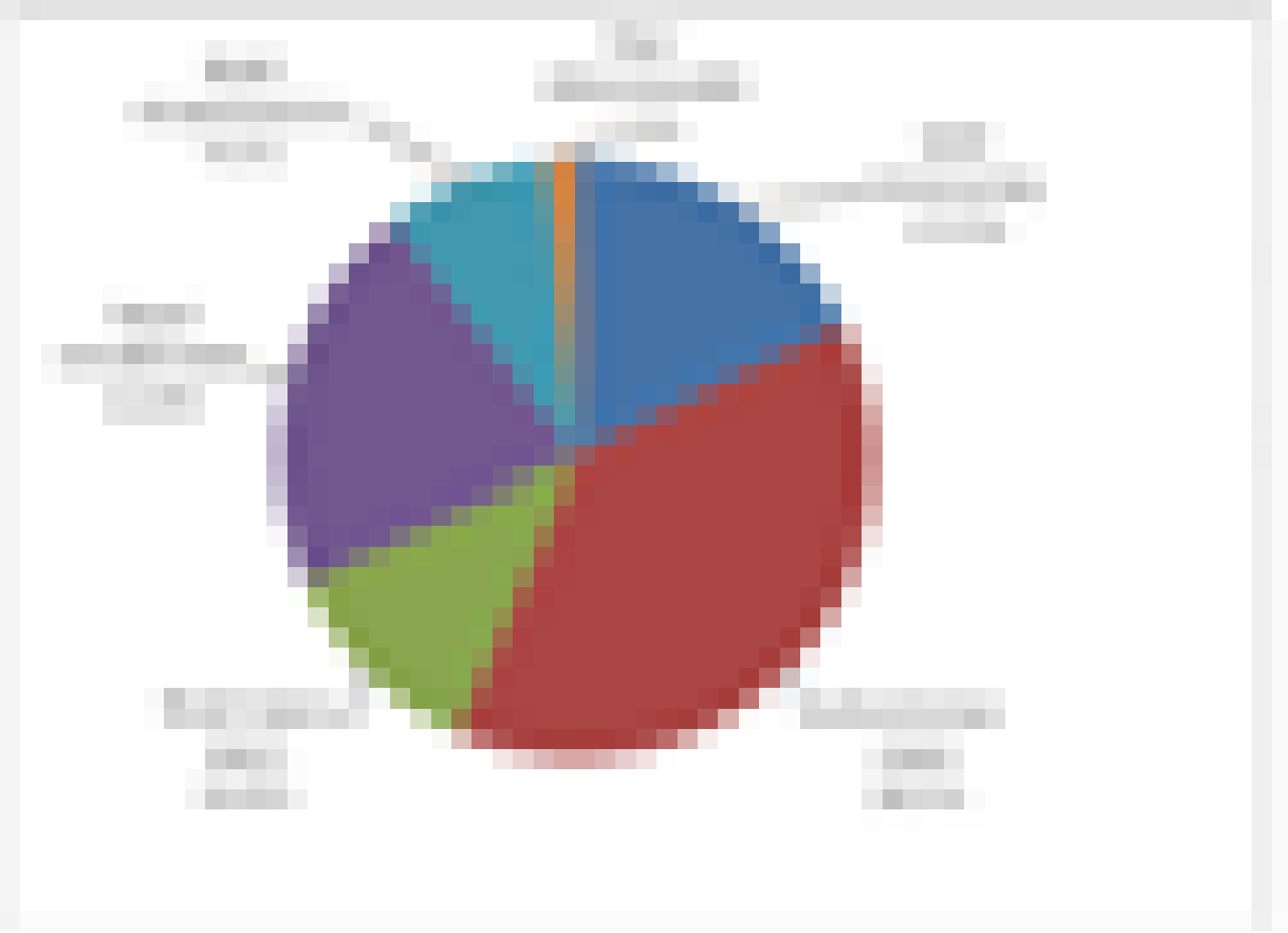


3. Present state of drinking water sector in Nepal

Access to drinking water: urban 90%, rural 81%
(Tap/piped 47.8%, Hand pump 35.1%, Well 12.9%, River 1.1%)

(Source: UN)

3.1. Conditions of piped water supply systems



(Source: UN)

3.2. Present status

Urban Area

Urban water demand is increasing rapidly at between 6% and 9% per annum.

Rural Area

Around 85% of Nepal's population currently lives in rural areas. Around 20% of the population do not yet have an access to safe drinking water.

Arsenic (As) contamination in groundwater

Nearly 47% of Nepal's population currently lives in the southern part of the country (the Terai region).

High levels of As contamination in the drinking water poses a serious risk to the health of resident living in the Terai plain regions.

3.3. Melamchi Water Supply Project

Purpose : Diversion raw water from the Melamchi river to Sundarijal outlet

Capacity : 170,000 m3/d

Beneficiaries : 1,100,000 persons in Kathmandu Valley

Total Cost : 350 million USD

Progress : Construction started in 2009, completion expected in 2016

4. Prospect of investment in drinking water sector in Nepal

Opportunities

- Increasing demand of clean & safe water
- Economic growth
- Intention from international financing agencies

Challenges

- Scattered settlements
- Thin population density
- High cost
- Contamination of water sources
- Unstable electricity supply

4.1. Implementation Planning for Water Project

Short-term measures

- Grant from foreign countries
- Soft loan (EDCF by GOK, Concessional loan by ADB)

Long-term measures

- Foreign Direct Investment (on a basis of BOOT)
  - ✓ Some conditions required: “Take-or-pay” guarantee
  - ✓ Priority: Cities

4.2. Recommendations

A program for reconstruction and rehabilitation for water supply systems with improved water quality should be initiated.

Improvement in functionality and quality of water supply systems must be taken into consideration.

GON needs to establish investment-friendly environment in drinking water sector in Nepal.

K-water is eager to cooperate with GON to promote joint activities such as knowledge sharing, capacity building and exchange of experts.

Thank you for your attention !