Chameliya Hydroelectric Power Project

& Our interest in New Projects in Nepal

Hydropower Business Team, KHNP
Heartily welcome to Korea

For the celebration of the 40\textsuperscript{th} anniversary of the establishment of diplomatic relationship between Nepal and the Republic of Korea

Thanks to the Embassy of Nepal, Seoul for the invitation
I Introduction of KHNPCorea Hydro & Nuclear Power Co.

II Chameliya Hydroelectric Project

III HydroPower projects in Nepal
I Introduction of KHNP
Introduction of KHNP

Organization

President & CEO

- Safety, Quality & Technology Division
- Planning Division
- Administration Division
- Construction Division
- Power Generation Division
- Engineering Division
- Hydro Power Division

KHNP New York Office
KHNP Paris Office
Abu Dhabi Branch Office
Kori Nuclear Power Site
Hanbit Nuclear Power Site
Wolsong Nuclear Power Site
Hanul Nuclear Power Site

Hangang Hydro Power Site
Cheongpyeong Pumped Storage Power Plant
Yangyang Pumped Storage Power Plant
Yecheon Pumped Storage Power Plant
Sancheong Pumped Storage Power Plant
Samrangjin Pumped Storage Power Plant
Muju Pumped Storage Power Plant

Hydropower Business Team
## Introduction of KHNP

### Human Resources

<table>
<thead>
<tr>
<th>Classification</th>
<th>Number of Staffs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board of Directors</td>
<td>6</td>
</tr>
<tr>
<td>Managers</td>
<td>3,165</td>
</tr>
<tr>
<td>Staffs</td>
<td>5,203</td>
</tr>
<tr>
<td>Research</td>
<td>320</td>
</tr>
<tr>
<td>Temporary, Security</td>
<td>893</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>9,587</strong></td>
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<With Leading Technology, KHNP provides 30% of power supply in Korea>
## Introduction of KHNP

### Power Generation Facilities

<table>
<thead>
<tr>
<th>Classification</th>
<th>Nuclear</th>
<th>Hydropower - Small Hydro</th>
<th>Pumped - Storage</th>
<th>Solar</th>
<th>Wind</th>
<th>Fuel cell</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kori</td>
<td>4</td>
<td>35</td>
<td>16</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>81</td>
</tr>
<tr>
<td>Shin-kori</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Hanbit</td>
<td>6</td>
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<tr>
<td>Hanul</td>
<td>6</td>
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<td></td>
</tr>
<tr>
<td>Wolsong</td>
<td>4</td>
<td></td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>Shin-Wolsong</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Units</td>
<td>4</td>
<td>606.1 (2.3%)</td>
<td>4,700</td>
<td>56.25</td>
<td>0.75</td>
<td>58.8 (0.2%)</td>
<td>26,138MW (100%)</td>
</tr>
<tr>
<td>Capacity (MW)</td>
<td>3,137</td>
<td></td>
<td>5,900</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2,000</td>
<td></td>
<td>2,779</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5,900</td>
<td></td>
<td>1,000</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>2,779</td>
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</tr>
<tr>
<td></td>
<td>5,900</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>20,716 (79.2%)</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

### Power Generation Facilities in Korea

- **Total**: 86,136MW
- **KHNP**: 30%
- **K-Water**: 17%
- **ETC**: 1%
- **Thermal Power Generation Companies**: 51%
- **K-Water**: 2%

### Hydropower Facilities

- **Total**: 5,306MW
- **KHNP**: 82%
- **K-Water**: 17%
- **ETC**: 1%
Introduction of KHNP

Financial Status

<As of 2013>

Current Assets USD 3.74 billion
Non-Current Assets USD 43.07 billion

Sales USD 6.40 billion
Profit USD 0.26 billion

<table>
<thead>
<tr>
<th>Credit Rating</th>
<th>Moody’s</th>
<th>S&amp;P</th>
<th>Fitch</th>
<th>R&amp;I</th>
</tr>
</thead>
</table>

Liabilities & Capital

Capital 44% (USD 20.73 billion)
Liabilities 56% (USD 26.08 billion)
Chameliya Hydroelectric Project
Project Overview

- Project Name: 30MW Chameliya Hydroelectric Power Project
- Work Scope: Supply, Installation of EM/HM/TL
- Employer: Nepal Electricity Authority, NEA
- Contractor: **KHNP Consortium**
  
  <KHNP, HCPC, SEAN ENC, Nepal Hydro Electric Ltd. (NHE)>

- Contract Price: **USD 48million** (USD 39.8million + NRs 650million)
- Funding: Korea – Nepal Economic Development Cooperation Fund (EDCF)
Organization

NEA (Nepal Electricity Authority)
- Employer of the Project
- Operation after completion

Shah Consultant
- Civil Consultant & Engineer
- Providing Recommendation

SAMAN Consultant
- EM/HM Consultant & Engineer
- Providing Recommendation

CGGC (Civil Contractor)

KHNP Consortium (EM/HM/TL Contractor)

KHNP
(Total Management, Main Equipment)

HCPC
(Auxiliary Equipment, Design)

SEAN ENC
(Transmission Line)

NHE
(Installation of EM/HM)
Work Scope of KHNP Consortium
Project Status

Annual Total work Progress

<table>
<thead>
<tr>
<th>Year</th>
<th>Plan</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>35.8</td>
<td>25.7</td>
</tr>
<tr>
<td>2011</td>
<td>94.1</td>
<td>76.5</td>
</tr>
<tr>
<td>2012</td>
<td>86.6</td>
<td>83.0</td>
</tr>
<tr>
<td>2013</td>
<td>95.9</td>
<td>86.0</td>
</tr>
<tr>
<td>2014.03</td>
<td>100.0</td>
<td>87.1</td>
</tr>
</tbody>
</table>

1st Time Extension (13.08.31)  2nd Time Extension (15.03.14)

Clarification

<table>
<thead>
<tr>
<th>Clarification</th>
<th>Equipment Supply (USD)[%]</th>
<th>Installation (NRs)[%]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Main Equip.</td>
<td>Aux. Equip.</td>
</tr>
<tr>
<td>KHNP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HCPC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEAN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NHE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Progress</td>
<td>98.5</td>
<td>98.6</td>
</tr>
</tbody>
</table>
Major Issues

Oct. 22, 2008 Bidding

Apr. 30, 2009 Contract Signing  
*Project Period: May. 2009 ~ Dec. 2011*

Sep. 30, 2011 Time Extension of the Project (1st)  
*Extended Period: Dec. 17, 2011 ⇒ Aug. 31, 2013*

Due to Constant Civil Work delay  
20 months

Nov. 2011 ~ Jun. 2013 Efforts for the normalization of the Project

Several discussions were held between officials of Government of Korea and with Minister/Secretary of MoE and MoF and NEA

Jul. 17, 2013 Employer (NEA) extended Project time (2nd)  

Aug. 29, 2013 Termination of the Contract

Sep. 02, 2013 K-EXIM requests amicable agreement through mutual cooperation

Oct. 25, 2013 Minutes of Meeting

Contractor continues the work at site

Consultant prepare final report for 1st time extension cost

NEA agrees to make payment for 1st time extension after Board approval
Chameliya Hydroelectric Project

Major Issues Continue

Nov. 07, 2013 Withdrawal of Termination and Continue the work at Project Site

Validity of Bond was extended up to End of July, 2014
AP-Bond, AP-Bond(2.97million)

NEA Board of Director's final Approval for the Time Extension Cost is

Considering Current civil work progress, additional Time Extension is required

Original Period
Start 09.05.18
<31 months>
1st Time Extension 11.12.17 13.8.31 <20 months>
2nd Time Extension 15.3.14 <18 months>

?
Key Issues

- Delay in Treatment for the Squeezing section of Headrace Tunnel and vertical tunnel

- Delay in Tree cutting and Land Acquisition at Transmission Line

- Increase of Project cost
  Time Extension cost is not decided till date

- Warranty and Equipment Performance
  Manufacturer rejected extension of Warranty period
  Equipment has been stored at site without proper preservation

As the biggest Power company owned by Government of Korea, KHNP will do its utmost effort for the successful completion of the project.
Hydropower Project in Nepal
Opportunity for the development of Hydropower Project

Potential / Present 2,000MW / 750MW

Distribution Rate 18%

Power consumption has been increased 8.7% annually during past 10 years

Load Shedding 14 hours/day

Power Generation Facilities in Nepal

Hydropower 91%
Thermal 7.62%
Solar 0.01%

NEA 526.49 MW (74.6%)
IPP 178.98 MW (25.4%)
Power Industry in Nepal

Power Consumption and Supplier

Due to lack of power supply by NEA, Nepal has to import 42% of total power consumption from India or Private Sector
Prospect of Power Industry in Nepal

Power consumption would be increased 8.4%/year until 2017

Through Hydropower IPP Business, Nepal is seeking Power Generation and Economic Development

Hydropower business would be more important as time goes by.
Comparison of Hydropower Business Circumstances

- **Tariff**
  - Tariff negotiation: 3 Times
  - After F/S, EPC Signing, Commercial operating

- **Capacity Payment**
  - 97% of Payment is made during Stand-by status
  - Compensation for the power generation difference due to change in amount of rainfall

- **Guarantee**
  - Government guarantees enforcement agreement, power sales, water supply
  - Provide favorable conditions for Project Financing

- **FOREX**
  - Compensation for the Foreign Exchange loss

- **Taxation**
  - Vat Exemption for corporate Tax, Sales Tax and dividend Tax
  - 5% of Custom duty

- **ROE**
  - 17% of ROE Guaranteed
  - Suki Kinari (840MW)
  - Patrind (147MW)
Comparison of Hydropower Business Circumstance

<table>
<thead>
<tr>
<th>Project</th>
<th>Owner</th>
<th>Capacity</th>
<th>Completion</th>
<th>PPA</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likhu-4</td>
<td>Green Venture</td>
<td>120</td>
<td>‘14.12</td>
<td>USD 0.059</td>
<td>3% annual increase, 15years</td>
</tr>
<tr>
<td>Mistry</td>
<td>Robust Energy</td>
<td>42</td>
<td>‘16.5</td>
<td>NRs 4.66</td>
<td>3% annual increase, 15years</td>
</tr>
<tr>
<td>Upper Bhotekoshi</td>
<td>Bhotekoshi Power</td>
<td>36</td>
<td>‘01.5</td>
<td>USD 0.06</td>
<td>3% annual increase, 15years</td>
</tr>
<tr>
<td>Upper Tamakosh</td>
<td>Upper Tamakosh Hydropower</td>
<td>456</td>
<td>‘15.12</td>
<td>NRs 5.3</td>
<td>3% annual increase, 14years</td>
</tr>
<tr>
<td>Upper Marshyandi</td>
<td>Sinohydro Sagarmatha Power</td>
<td>50</td>
<td>‘16.9</td>
<td>USD 0.069</td>
<td>3% annual increase, 10years</td>
</tr>
</tbody>
</table>

Sovereign Credit Rating: “E” (K-EXIM, May, 2014)

Difficulties in Project Financing:
- Low PPA Price
- Refer to below table

High income Tax and Delay in Decision
Oversea Projects by KHNP

Tajikistan Golovnaya
Hydropower
- Capacity: 240 MW (160MW x 4)
- Cost: 8.7 million USD

Canada Narrows Inlet
Hydropower (EPC)
- Capacity: 33 MW (4 Units)
- Cost: 110 million CAD

Nepal Chameliya
Hydropower (EPC)
- Capacity: 30 MW (15MW x 2)
- Cost: 48 million USD

Indonesia Karama
Hydropower (BOT)
- Capacity: 450 MW (4 Units)

Nepal Indrawati
Hydropower (BOT)
- Capacity: 90 MW
- Cost: 150 million USD
Thank you