




KIDSTON PUMPED STORAGE HYDRO PROJECT - LESSONS LEARNT REPORT

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Disclaimer

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1. EXECUTIVE SUMMARY

Genex Power Limited (**Genex, Company or Owner**) is the 100% owner and developer of the Kidston Clean Energy Hub, located in North Queensland (the **Kidston Hub**). Stage 1 of the Kidston Hub was completed in the form of the 50MW Stage 1 Kidston Solar Project, which was energised in November 2017. Stage 2 of the Kidston Hub is the 250MW Pumped Storage Hydro Project (**K2-Hydro or Project**) which is currently under construction, having reached financial close in May 2021. A further Stage 3 of the Kidston Hub, being a wind project of approximately 150MW, is currently in feasibility stages along with a potential co-located solar farm of up to 270MW.

This Lessons Learnt Report will aim to provide a detailed analysis on the Project cost elements as at financial close, particularly focusing on the cost build up elements so they can be learnt from for future projects.

2. OVERVIEW OF COSTS

The Project has a total development cost of \$775M. This amount includes the core Project Engineering, Procurement and Construction (**EPC**) cost, the Project's contribution towards the capital cost of the new 186km transmission line from Kidston to Mount Fox, the surface connection assets at Kidston, other costs associated with the construction program for the Project and also costs associated with the financing. An overview of the capital costs is shown in the table below.

Table 1: Overview of key costs

| CATEGORY | PRICE (\$M) | PERCENTAGE |
|-----------------------------|--------------------|-------------|
| EPC Price | \$478 | 62% |
| Transmission | \$110 ¹ | 14% |
| Connection Assets | \$25 | 3% |
| Other Costs | \$79. | 10% |
| Contingency & Finance Costs | \$81 | 10% |
| TOTAL Project cost | \$775 | 100% |

The total Project cost of \$775.5M is funded from the following sources:

- \$118.5M equity contribution from the Project Owner;
- \$610M long term debt facility from NAIF; and
- \$47M funding from ARENA by way of a non-recoupable grant.

¹ This excludes the \$147.3M contribution from the Queensland State Government, contracted directly to Powerlink Queensland.

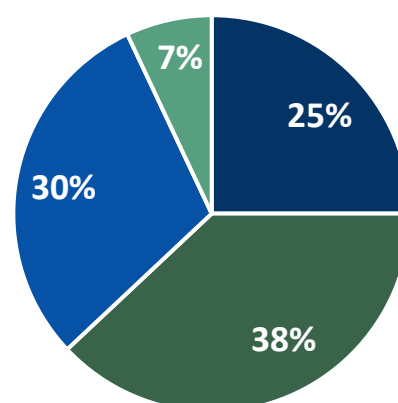
3. ENGINEERING, PROCUREMENT & CONSTRUCTION COST

McConnell Dowell (**MD**) and John Holland (**JH**) have formed a joint venture for the EPC component of K2-Hydro (**MDJH**). MD is a major infrastructure construction company having capability in underground and hydro power construction. JH, a subsidiary of one of the world’s largest infrastructure construction companies (China Communications Construction Co Ltd), is one of the largest EPC companies in Australia offering services across a wide range of sectors from power and energy to tunnelling and water infrastructure.

The total EPC cost is \$478M which makes up a significant portion of the total capital cost of the Project (62%). The EPC contract with MDJH is a fully-wrapped contract for the engineering, procurement and construction of the Project. As such, the contract of services required MDJH to procure all supplies for the Project, including the electromechanical equipment package from ANDRITZ as a nominated subcontractor. An overview of the EPC costs is shown in the table below.

Table 2: Overview of EPC Costs

| CATEGORY | PRICE (\$M) |
|--------------------------------|--------------|
| Staff costs and overheads | \$120 |
| Civil works | \$183 |
| Equipment/generator sets & BoP | \$142 |
| Engineering | \$33 |
| Total EPC Price | \$478 |



- Staff costs and overheads
- Civil works
- Equipment/generator sets & BoP
- Engineering

Unfortunately, given the confidential nature of the EPC contract, and the requirement for MD and JH to remain competitive, Genex is unable to provide a full breakdown of key EPC costs to the dollar value. However, in order to assist future project developers, Genex is able to provide a price range pertaining to each key component. A breakdown of the key costs associated with the EPC contract is outlined in the table below.

Table 3: breakdown of key EPC costs

| ITEM | PRICE RANGE \$M |
|------------------|-----------------|
| Upper Reservoir | \$20 - \$25 |
| Lower Reservoir | \$10 - \$15 |
| Intake Structure | \$1 - \$5 |

| | |
|-------------------------------------|---------------|
| Vertical Shafts | \$20 - \$25 |
| Horizontal Tunnels | \$25 - \$30 |
| Powerhouse Civil | \$30 - \$35 |
| Hydromechanical (excl OEM) | \$15 - \$20 |
| Hydromechanical (OEM) | \$130 - \$135 |
| Above ground Bldgs / Services | \$5 - \$10 |
| Tailrace Tunnel | \$10 - \$15 |
| Site Establishment and Mobilisation | \$20 - \$25 |
| Design works | \$35 - \$40 |
| Project Running Cost | \$105 - \$110 |

4. BALANCE OF PLANT

Energy Solutions Pty Ltd (**BEON**) have been appointed to deliver and develop the connection assets infrastructure at Kidston under a Design and Construction Contract (**D&C**). Beon delivers large-scale renewable power generation including solar, wind and energy storage solutions Australia.

Unfortunately, given the confidential nature of the D&C contract, and the requirement for the contractors to remain competitive, Genex is unable to provide a breakdown of costs to the dollar value. However, in order to assist future project developers, Genex is able to provide a price range pertaining to each key component. A breakdown of the key costs associated with the D&C contract is outlined in the table below.

Table 4: breakdown of key BoP costs

| ITEM | PRICE RANGE \$M |
|--------------------------------------|-----------------|
| K2H Switchyard | \$5 - \$10 |
| K2X Switchyard | \$5 - \$10 |
| 275KV Transmission line (K2H to K2X) | \$1 - \$5 |
| 22KV Distribution Line | \$1 - \$5 |
| Design Work | \$1-\$5 |
| Project Running Cost | \$1-\$5 |

5. POWERLINK CONNECTION ASSETS

As per Table 1, Genex contributed \$110.9M towards the construction of the new 275kV single circuit, 186km transmission line from Kidston to Mt Fox and the new substation at Mt Fox (**Connection Assets**). The Queensland Government provided \$147M in funding to Genex towards the construction of the Connection Assets, contributing to a total CAPEX of \$257M. The Connection Assets are to be developed and owned by

Powerlink. Unfortunately, given Genex doesn't hold ownership of these assets, we are unable to provide a detailed breakdown of costs associated with this development.

6. OTHER COSTS

The Other Costs totalling \$79M comprise costs associated with:

- Refurbishment and expansion of the mine camp;
- Camp facilities and management (including operating costs);
- Upgrade of the airfield; project insurances;
- Owners engineer; independent certifier;
- Q-Leave;
- Electricity costs for the whole project including construction requirements;
- Asset management;
- communications installation and operating costs; and
- O&M establishment costs, and services upgrades.