SIMULATION OF LIFE CYCLE COSTING ANALYSIS TO EVALUATE PROJECT OF INSTALLATION HIGH VOLTAGE UNDERSEA CABLE 150 KV CIRCUIT III & IV JAVA-BALI

Ngapuli **SINISUKA**, Bandung Institute of Technology, ITB, (Indonesia), n_sinisuka@yahoo.com
Iqbal **FELANI**, PLN, Electricity Utility Company, (Indonesia), iqbalfelani_tm04@yahoo.com
Novrizal **ERDIANSYAH**, PLN, Electricity Utility Company, (Indonesia), ichal_97@yahoo.com, novrizal@pln.co.id

ABSTRACT

PLN, an Indonesian electricity utility company, has planned to install additional high voltage undersea cable for circuit III and IV Java-Bali to fulfill electricity demand in Bali. This project was more prefered compared to building another power plant in Bali which could raised social and cultural resistance. Life-Cycle-Cost method was used to completed the financial feasibility study to ensure the project has economic benefit, and the asset would be used effectively and efficiently along its benefit period. In this paper, a Life Cycle Cost will be simulated to analyze which alternative is the most profitable: installation circuit III and IV in 2012 or installation circuit III in 2012 and circuit IV in 2017 in accordance with load forecasting needed. This study is used to help the management to make a decision about the project.

KEYWORDS

Financial feasibility; life cycle cost; high voltage undersea cable installation.

INTRODUCTION

The island of Bali in Indonesia, is one of the favourite tourism destination in the world. It has cultural diversity and beautiful beaches supporting so tourism as the main business in Bali. This island is located in the east of Java, the main island in Indonesia.

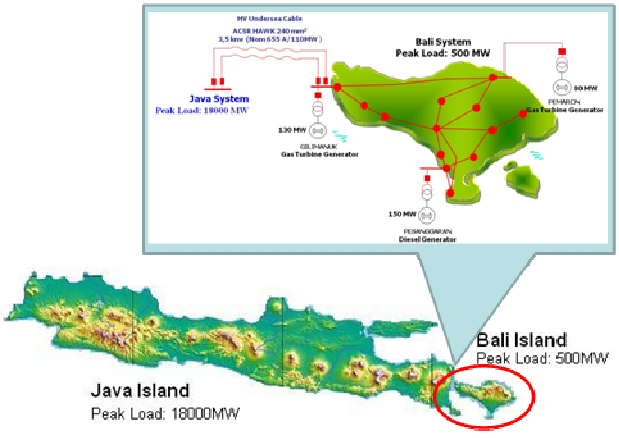

Fig. 1: Java Bali Interconnection

Currently, Bali's electricity system (Fig. 2) is called by net importer. It means Bali has lower power plant capacity compared to its load. In 2010 Bali had 548.5 MW peak load. The composition of electricity supply in Bali is showed in Table 1.

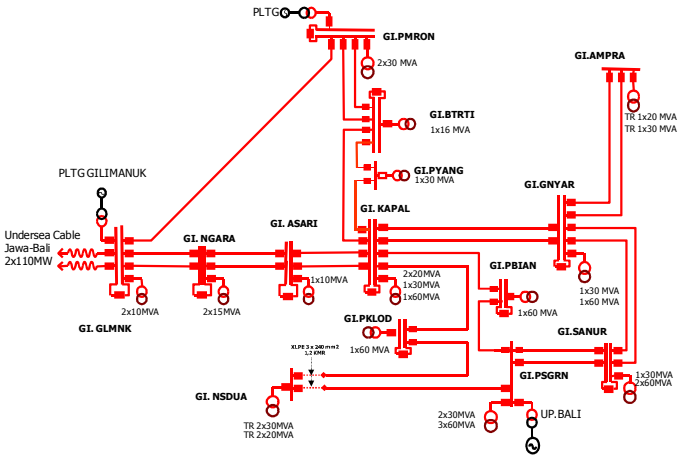

Fig. 2: Single line diagram configuration

No	Power Supply	Capacity (MW)	BPP (IDR/kWh)
1	PLTG + PLTD Pesanggaran	150	1836.13
2	PLTG Pemaron	96	1941.52
3	PLTG Gilimanuk	130	1790.62
4	Undersea Cable (circuit 1&2)	220	783.00
Total		**596**	

Table 1: Existing electricity supply

To anticipate the increasing electricity demand, PLN conducts planning study every 10 years. Based on short term load forecast (2011-2020) with linear regression analysis, the existing electrical system of Bali will not meet the demand in 2012 (demand is assumed with peak load). New investment is required to keep Bali's system for the next 10 years. Load forecast with linear regression analysis in Bali's system is shown in Fig. 3.

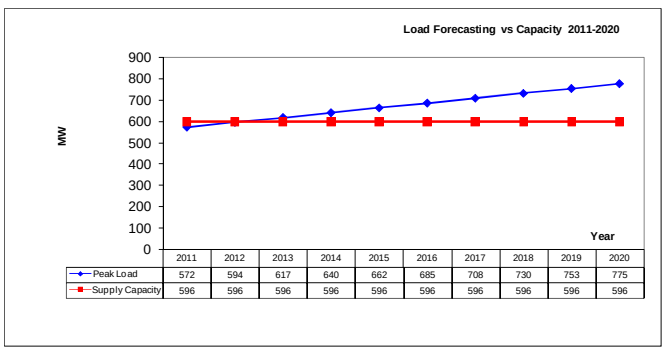

Fig. 3: Load Forecasting 2011-2020

GENERATING THE ALTERNATIVES

There are two alternatives to meet the demand in Bali's system;