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இலங்கை மின்சார சபை
CEYLON ELECTRICITY BOARD

Your ref: My Ref: DGM(CS&RA)/GEN/05-07 Date: November 11th, 2022

Director General
Public Utilities Commission of Sri Lanka
6th Floor, BOC Merchant Tower
No.28, St, Michael's Road
Colombo 3.

PUBLIC UTILITIES COMMISSION OF SRI LANKA
3.00 PM
11 NOV 2022
4883.

Dear Sir,

SUBMISSION OF THE DRAFT LONG TERM GENERATION EXPANSION PLAN (LTGEP) 2023-2042

This has reference to letter PUC/LIC/2022/TL/94 dated 2022-10-18 addressed to Additional General Manager – Transmission, requesting information in order to approve the Long Term Generation Expansion Plan 2023-2042.

Accordingly, requested clarifications are forwarded herewith for your information please **(Annex-1).**

Yours faithfully,
CEYLON ELECTRICITY BOARD

Eng. (Dr.) D.C.R. Abeysekera
General Manager
Ceylon Electricity Board

Eng. (Dr.) D.C.R. Abeysekera
General Manager
(Authorized officer for Licenses EL/GB/09-001, EL/T/09-002, EL/D/09-003, EL/D/09-004, EL/D/09-005, EL/D/09-006)

Copy: Addl.GM (CS) *- fipls*
DGM(Tr & Gen Planning)/ Addl.GM (Tr – NWO) *- fipls*

Annex -1

Documents listed in the references section

1. **National Demand Forecast 2023-2047, Transmission and Generation Planning Branch, CEB**

   This refers to a separate study conducted which is summarized in chapter 3.

2. **Integration of Renewable Based Generation into Sri Lankan Grid 2023-2032, CEB**

   This refers to a comprehensive study which is not compiled and available as a report/document. Furthermore transmission related studies are not completed yet. However, section 5.4.1 (Renewable Energy Grid Integration Study 2023-2032) summarizes the methodology of the study and chapter 9 presents the main outcomes related to operational study which is used for LTGEP 2023-2042.

Financial models including cash flow calculation workings for NPV of each of the following scenarios of the planning study

1. **Scenario 1: Achieving 70 % RE by 2030, maintaining 70% RE beyond 2030 and no coal fired plant additions throughout the horizon [NPV 18,872 MUSD]**

   The Present Value cost is based on economic terms. Hence no financial model of cash flow is represented.

2. **Scenario 2: Achieving 70 % RE by 2030, attempt to further increasing RE share up to 80% by 2040 and no coal fired plant additions throughout the horizon**

   The Present Value cost is based on economic terms. Hence no financial model of cash flow is represented. The Present Value is not indicated as the objective of increasing Renewable share is not achieved with current storage technologies.

3. **Scenario 3: Achieving 70 % RE by 2030, maintaining 70% RE beyond 2030, no coal fired plant additions throughout the horizon and considering cross border interconnection with India [NPV 18,883 MUSD]**

   The Present Value cost is based on economic terms. Hence no financial model of cash flow is represented.

4. **Scenario 4: Achieving 70 % RE by 2030, maintaining 70% RE beyond 2030, no coal fired plant additions throughout the horizon and considering nuclear power development beyond 2040 [NPV 18,986 MUSD]**

   The Present Value cost is based on economic terms. Hence no financial model of cash flow is represented.

5. **Scenario 5: Achieving 50% RE by 2030, maintaining 50% RE beyond 2030 and no coal fired plant additions beyond 2030 [NPV 17,792 MUSD]**

   The Present Value cost is based on economic terms. Hence no financial model of cash flow is represented.

6. **Scenario 6: Achieving 60 % RE by 2030, maintaining 60% RE beyond 2030 and no coal fired plant additions beyond 2030 [NPV 17,507 MUSD]**

The Present Value cost is based on economic terms. Hence no financial model of cash flow is represented.

7. **Scenario 7: Achieving 60 % RE by 2030, maintaining 60% RE beyond 2030 and no coal fired plant additions throughout the horizon [NPV 17,855 MUSD]**

   The Present Value cost is based on economic terms. Hence no financial model of cash flow is represented.

Financial models including cash flow calculation workings for NPV of each of the following sensitivity scenarios of the planning study

1. **Present Value of costs of Scenarios for Fuel Price Sensitivities (High fuel price) [NPV 17,792 MUSD]**

   The Present Value cost is based on economic terms. Hence no financial model of cash flow is represented. The Present Value for High fuel price sensitivity for Base Case is also not 17,792 MUSD , but 22,088 MUSD as indicated in Table 10.8 of the report.

2. **Present Value of costs of Scenarios for Fuel Price Sensitivities (Low fuel price) [NPV 17,507 MUSD]**

   The Present Value cost is based on economic terms. Hence no financial model of cash flow is represented. The Present Value for low fuel price sensitivity for Base Case is also not 17,507 MUSD , but 17,187 MUSD as indicated in Table 10.8 of the report.

3. **Sensitivity of Cost Projections for Base Case (70% RE) [NPV 16,254 MUSD]**

   The Present Value cost is based on economic terms. Hence no financial model of cash flow is represented.

4. **Sensitivity of Cost Projections for Scenario 5 (50% RE) [NPV 15,457 MUSD]**

   The Present Value cost is based on economic terms. Hence no financial model of cash flow is represented.

5. **Sensitivity of Cost Projections for Scenario 6 (60% RE) [NPV 15,300 MUSD]**

   The Present Value cost is based on economic terms. Hence no financial model of cash flow is represented.

Demand Projection

1. **Projection of the following key variables for the 2022-2043 period for demand projection**
   a. **GDP per capita**
   b. **Industrial sector gross value added**
   c. **Service sector gross value added**

	a	b	c
Year	GDP Per Capita /Rs.	Industrial sector GVA /Rs. Mill	Service sector GVA /Rs. Mill
2023	501,464	2,864,363	6,601,517
2024	530,818	3,050,547	7,030,616
2025	564,656	3,264,085	7,522,759
2026	600,785	3,492,571	8,049,352
2027	642,352	3,754,514	8,653,054
2028	686,949	4,036,102	9,302,033
2029	734,807	4,338,810	9,999,685
2030	782,511	4,642,526	10,699,663
2031	831,533	4,955,897	11,421,890
2032	883,796	5,290,420	12,192,868
2033	937,352	5,634,297	12,985,404
2034	989,736	5,972,355	13,764,529
2035	1,040,377	6,300,835	14,521,578
2036	1,091,289	6,631,628	15,283,960
2037	1,142,256	6,963,210	16,048,158
2038	1,190,213	7,276,554	16,770,326
2039	1,240,504	7,603,999	17,524,990
2040	1,292,753	7,946,179	18,313,615
2041	1,340,757	8,264,026	19,046,159
2042	1,391,882	8,594,588	19,808,006
2043	1,444,956	8,938,371	20,600,326

2. **Net loss projection for 2035-2043 and the basis for the same**

We have already clarified vide our letter reference DGM(CS&RA)/GEN/05-08 dated 2022-10-12 as a reply to similar clarification previously sought by PUCSL on the same matter.

3. **Calculation and basis for Figure 3.6a and Figure 3.6b**

Figure 3.6a plots actual monthly records of the night peak, day peak and off peak from 2011 to 2020, as already explained in section 3.3.3 of draft LTGEP 2023-2042.

Figure 3.6b depicts a sample of generalised curve shapes predicted for future. Further explained in chapter 3.

General

1. **Calculations for FSRU regassification and pipeline cost**

The Handling charge is approximated based on data based on prefeasibility studies. The main cost components are

i) Cost of FSRU and Mooring 174 million USS
ii) Cost of Pipeline 37.5 million USS.
iii) Annual O&M Cost of 53 million US$.

2. **Basis for selecting the JCC 12.5% as the applicable natural gas cost for Sri Lanka**

The report does not mention JCC 12.5% as the basis for LNG price in Sri Lanka.

3. **Detailed capex and opex costs and basis for these values for thermal and renewable energy projects (Annex 4.1 and Annex 5.3)**

Thermal

All details of capex and opex cost are already provided in Table 4.1 which was based for the specific cost calculation in Annex 4.1. These are based on latest references from international organizations.

Renewable

All details of capex and opex cost are already provided in Annex 5.3. These are based on latest references from international organizations and recent CEB tender prices.