

Public Utilities Commission of Sri Lanka

Commission Paper

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| Paper No.: PUC/2020/241/EER/01 | Date: 1 st June 2020 |
| Subject : Estimation of Externality Cost of Thermal Power Generation in Sri Lanka | Previous Ref (if any): PUC/2019/233/EER/02, PUC/2018/213/EER/02 |
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| <p style="text-align: center;"><i>[Signature]</i> 17/6/20</p> <p style="text-align: center;">Through Deputy Director General</p> <p style="text-align: center;"><i>[Signature]</i> 01/06/2020</p> | <p style="text-align: center;"><i>[Signature]</i> 01/06/2020</p> |

Introduction.

According to the SLEA, the LTGEP should be prepared considering the least cost principles, however, due to unavailability of externality cost of power generation estimated for Sri Lanka, CEB formulating the LTGEP without considering these cost.

Therefore, with the objective of estimating the social and environmental damage cost associated with fossil fuel based thermal power generation, the PUCSL commissioned the above study in October 2018. It is expected that the estimated externality cost values through this study would be used for selecting the optimal technologies for power generation in Sri Lanka in the process of formulating LTGEP.

The Final Draft Report of the above assignment is completed by the consultants and submitted to the Commission. A copy of the report is attached herewith for your reference.

Under this study, four thermal power plants in Sri Lanka were selected for case studies, based on the generation technology and the type of fuel used, to estimate the cost of externalities of each technology type. The selected thermal power plants are:

1. Lak Vijaya Power Plant (LVPP) in Norochcholai
2. Yagadhanavi Power Plant in Kerawalapitiya,
3. Kelanitissa Power Station in Peliyagoda,
4. Sapugaskanda Power Plant in Sapugaskanda.

The outcomes of the study revealed that the externality cost is in increasing trend annually. However, the latest values obtained through the study is for the year 2017 and those are shown below.

| | Power Plant | Specific externality cost (Rs/kWh) |
|---|---------------------------|------------------------------------|
| 1 | Lak Vijaya Power Plant | 10.23 |
| 2 | Yagadhanavi Power Plant | 4.53 |
| 3 | Kelanitissa Power Station | 7.55 |
| 4 | Sapugaskanda Power Plant | 4.65 |

Annex 1.

| No | Scenario | Plant Composition in 2039 | | | | | | | | | | PV Cost up to year 2039 (Mn. USD) |
|----|--|---------------------------|---------------------|---------|----------|-------------|------------------|----------|------------------|--|--|-----------------------------------|
| | | NG 300MW | Puttalam Coal 300MW | GT 35MW | NG 600MW | Diesel 15MW | Other Coal 300MW | NG 150MW | Pump Hydro 200MW | | | |
| 1 | CEB Base Case plan (without externality cost) | 10 | 3 | 3 | - | 7 | 5 | - | 3 | | | 13,761 |
| 2 | CEB Optimized Base Case (without externality cost) | 3 | 3 | 3 | 1 | 7 | 9 | 1 | 3 | | | 13,524 |
| 3 | CEB Optimized Base Case (with Externality costs obtained by the study) | 9 | - | 3 | 4 | 7 | - | - | 3 | | | 18,854 |
| 4 | CEB Optimized Base Case Changing RM to 2.5%-20% (without externality cost) | 3 | 3 | 3 | 1 | 7 | 9 | - | 3 | | | 13,428 |
| 5 | CEB Optimized Base Case Changing RM 2.5%-20% (with Externality cost obtained by the study) | 10 | - | 3 | 3 | 7 | - | 1 | 3 | | | 18,833 |

- All scenarios are based on the previously CEB submitted base case
- For the analysis of scenario 3 & 5, externality cost figures were taken from the “Study Report on Estimation of External Cost of Thermal Power Generation in Sri Lanka” compiled by PUCSL.
 - Coal – 6.53 US cents/kWh (Figure of Lakvijaya Plant)
 - Natural Gas – 2.18 US cents/kWh (1/3 of the external cost for coal)
 - Oil – 5.03 US cents/kWh (Figure of Kelanitissa Plant)