EP UK Investments

A member of the EPH Group

CMC_02_25 Separate De-Rating Factor for New vs. Existing Capacity
Capacity Workshop 42

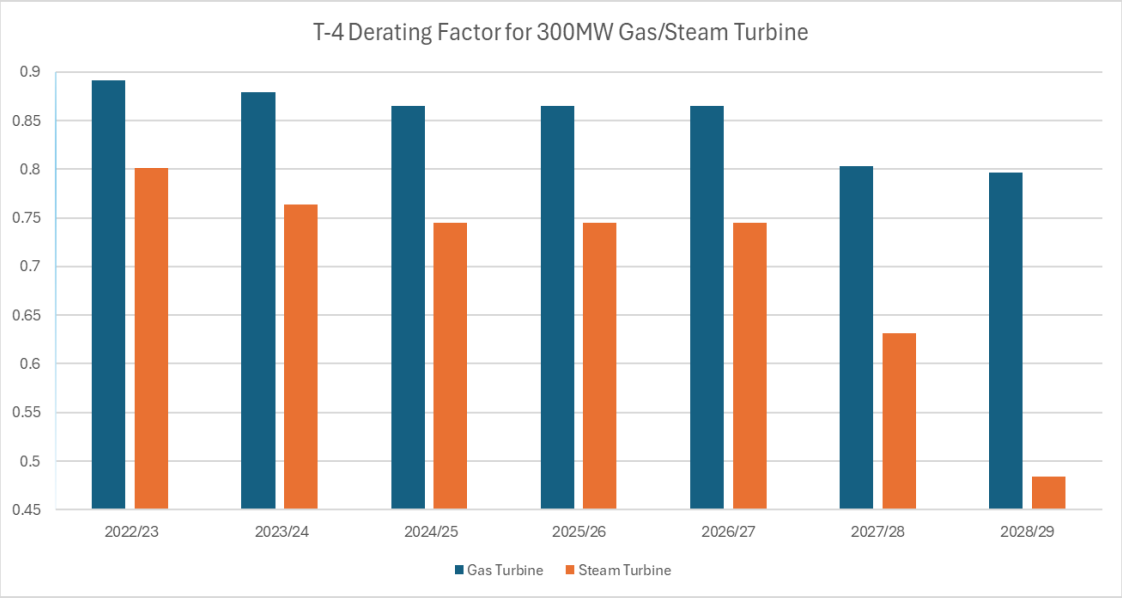
Background

- This modification proposes to introduce references to a new age parameter within the calculation of de-rating curves/factors in the Capacity Market Code.
- This will enable a separate de-rating factor for capacity units which are the same size and technology but different ages.
- The methodology for calculating de-rating outside of the Code, so no proposals are made on the effect of the age parameter, this would be addressed through the TSOs' methodology.
- Age of unit is to be calculated based on issuance of Final Operational Notification or, where issued, Market Readiness Certificate.
- One approach might be to consider age of units in blocks of five or ten years which might simplify the application of this change.
- This change will result in more accurate de-rating factors for New Capacity.

Rationale

- Current de-rating factors in the SEM are based on an older fleet of generation. Additionally, the smaller size of SEM (compared to other regulatory jurisdictions) means that one or two large plants suffering a major outage will materially impact de-rating across an entire technology class.

- These factors have contributed to a recent trend of falling de-rating factors:



Rationale

- This trend results in de-rating factors for technologies which do not reflect the actual expected reliability of a New Capacity unit. This undermines the investment case for New Capacity which require higher price caps in order to recover revenue lost through de-rating.

- The SEMC has acknowledged participants' concerns around the impact of declining de-rating factors on the financial viability of new investment in 2024 and stated "*it is arguable that new units should have better availabilities and should not have the DRFs reduced to such an extent by the poor performance of units which may be as much as 40 years old".*

- The de-rating factors for new units of the same size and technology are significantly higher in other regulatory jurisdictions. For example, in GB in the most recent T-4 auction, the factor applied to gas turbines was 0.9435 (18% higher than the factor applicable to a 300MW gas turbine in the SEM).

- This modification helps to address this barrier to investment while largely retaining the existing de-rating methodology.

Supporting Studies

- **A data-driven approach for predicting long term degradation of a fleet of micro gas turbines (Olsson, et. al):** "*Like any other physical assets, the performance of gas turbines degrades over time and shows a distinct degradation pattern and rate".*

- **Multi-mode Operation of Combined Cycle Gas Turbines with Increasing Wind Penetration (Troy & O'Malley):** "*Increases in start-stop cycling, ramping, and part-load operation for a CCGT unit […] result in serious physical deterioration of a CCGT plant's components and consequently reduces the reliability and lifetime of a plant".*

- **Gas Turbine Performance Prognostic for Condition-Based Maintenance (Li & Nilkitsaranont):** "*Gas turbine engines experience degradations over time that cause great concern to gas turbine users on engine reliability, availability, and operating costs".*

- **Reliability Analysis of Gas Turbine Power Plant Based on Failure Data (El Berry, et al.):** "*Gas Turbine power plant reliability is a function of the failure rate which in turn depends on the equipment or systems' Mean Time between Failures and Downtime. These also depend on the complexity of the design, the environment, and the age of the equipment or system".*