The development of a coupled model of dynamics of a FOWT for the analysis of the failure modes

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Introduction

- Transitions in the wind industry from onshore to offshore has lead to an increase in the LCOE
- High failure rate of the power converter module and lack of accessibility lead to longer down time and as reduced availability
- Thermal stress accounts for up to 55% of the total failures of the OWT power converter

Aims and objectives

- To produce a coupled model of dynamics of the FOWT
- To access how the performance of the power converter is influenced by the dynamics of the FOWT

Methodology

- Literature review
- Software learning and Project modelling
- Analysis of results

Future work

- Thermal orientated design of the power converter module

Conclusions

- Movement towards multilevel converters
- Movement towards FRC WT
- Control techniques implemented to reduce the thermal loading

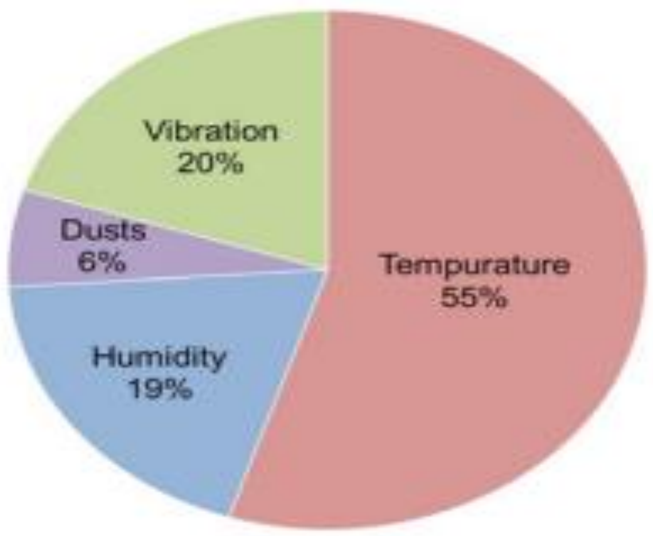

Figure 1: Causes of the failure modes of the power converter [1]

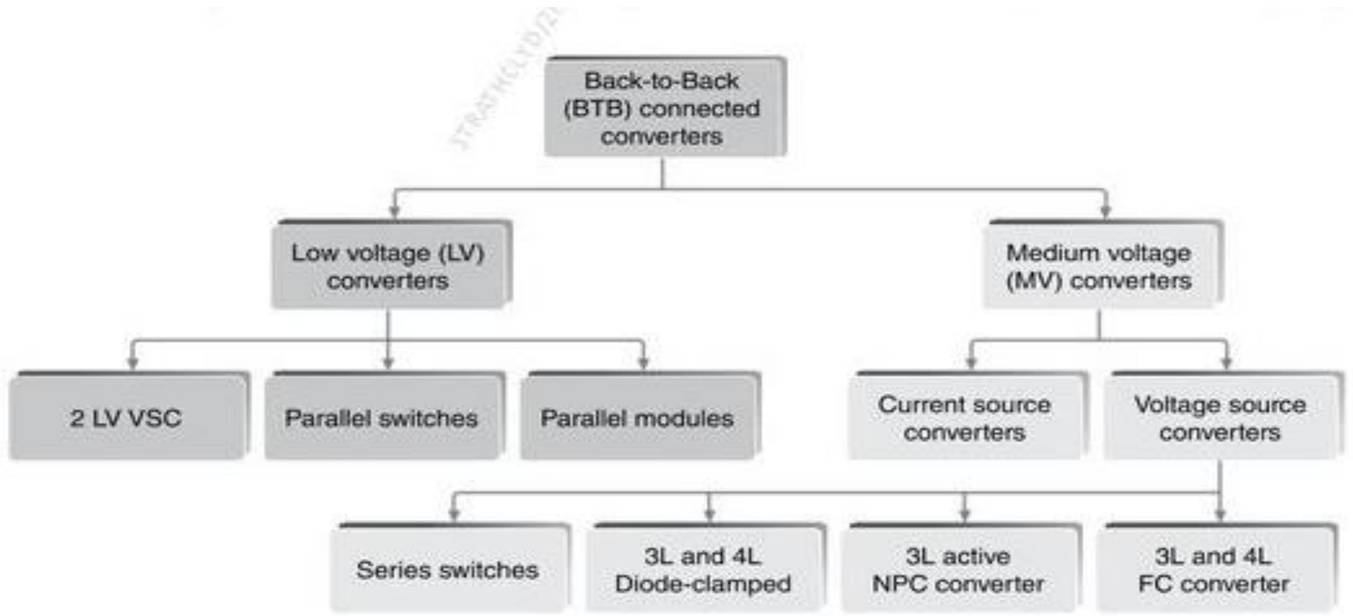

Figure 2: Classification of different BTB converter technologies [2]

References:
[1] Ma, K. (2015). *Power Electronics for the Next Generation Wind Turbine System* | *SpringerLink*. [online] Link.springer.com. Available at: https://link.springer.com/book/10.1007%2F978-3-319-21248-7#toc
[2] Anaya-Lara, O. (2018). VLeBooks - Logon. [online] Vlebooks.com. Available at: https://www.vlebooks.com/vleweb/Product/Index/1118424?page=0 [Accessed 7 May 2019].