

A Benders-based branch-and-cut approach to solve a wind turbine maintenance scheduling problem

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R sum  en anglais We deal with a maintenance scheduling problem rising in the onshore wind power industry. We address the problem on a short-term horizon considering an individual management of the technicians through a space-time tracking. The objective is to find a maintenance planning that maximizes the production of the turbines while taking into account wind predictions, multiple task execution modes, and task-technician assignment constraints. We introduce an exact method to solve this challenging problem. We first propose integer linear programming (ILP) formulations of this problem. Then, on this basis, we build up a Benders-based branch-and-cut approach making use of Benders cuts as well as problem-specific cuts. Our method solves to optimality most of the instances or delivers solutions with a small average gap with respect to upper bounds. The results suggest that our method significantly outperforms the direct resolution of ILP models.

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